

Greater Depth in Maths at Hopton

Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. National Curriculum 2016 and Interim Teacher Assessment Framework (ITAF) -

To aim for greater depth teachers should *focus on developing the complexity of problem solving in the area by keeping the concept but changing the context.* NCETM

Mastery is something which allows children to have a solid enough understanding to be able to move on to be taught new content whereas working at greater depth pertains to working on current content, but at a deeper level. NCETM

'Children who are working at greater depth are encouraged to reason more precisely, deal with more complex problems, suggest multiple strategies and approaches to solving calculations, and compare different approaches taking efficiency into account.'

Key characteristics of children working at greater depth:

- Working independently
- Applying their knowledge to different areas
- Applying their knowledge consistently, fluently and with confidence.
- Being able to explain their reasoning to others and teach their peers.

So What Does Greater Depth Look Like In Maths?

Any discussions about what greater depth looks like in maths has to take into account the three R's of maths: **reflecting, representing and reporting**, and they are:



1. **Reflecting.** Children need the breathing space to reflect on an experience when deepening their knowledge and understanding. Pausing, probing and pondering all happen when children are not rushed or pressured. Slowing down allows children to take control of their learning and become aware of their own learning too.

2. *Representing*: Children need plenty of opportunities to represent their learning in an active way so deepening becomes memorable. This might be constructing a model, drawing a mathematical picture, using manipulatives or writing down their thoughts.
3. *Reporting*: Children have to engage in meaningful maths talk with others – maths has to involve lots of verbal back and forth. Pupils refine, consolidate and develop their understanding by entering into learning conversations with their peers and teacher(s). This type of reporting helps children to realise that their thoughts are valuable and by talking together they can clarify their understanding. (Taken from Third Space Learning)

Year 1 – Numeracy Greater Depth

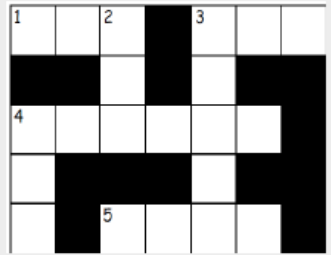
Use Focus Maths Year 1, Year 1 Mastery Assessment documents for all practical questions and problems for all children working at Greater Depth. All examples have been taken from these documents to give teachers a better understanding of greater depth questioning.

Number and Place Value

Code	POS - Expected	Greater Depth
NI	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number	<p>Find as many ways as possible to show a number or calculation e.g:</p> <p>Look at these cards:</p>  <p>Using the cards make up a 2-digit number that is:</p> <ul style="list-style-type: none">• Greater than 50;• Between 30 and 40;• Less than 50• Between 50 to 60 <p>Use explaining /justifying /convincing /proving e.g:</p> <p>Look at the set of three numbers below. Make a case for each being the odd one out.</p>  <p>Explain why a statement is correct or wrong e.g:</p>

		<p>What is wrong with these sequences?</p> <table border="1" data-bbox="678 264 1016 304"> <tr> <td>11</td> <td>13</td> <td>12</td> <td>14</td> <td>15</td> </tr> </table> <table border="1" data-bbox="678 325 1016 365"> <tr> <td>81</td> <td>85</td> <td>83</td> <td>84</td> <td>82</td> </tr> </table> <table border="1" data-bbox="678 386 1016 426"> <tr> <td>13</td> <td>16</td> <td>15</td> <td>14</td> <td>17</td> </tr> </table>	11	13	12	14	15	81	85	83	84	82	13	16	15	14	17	<p>I am going to count on from 20. Will I say the number 19? Convince me.</p> <p>I am going to count on in twos from 3. Will I say an even number? Convince me.</p> <p>I am going to count backwards from 20. How many steps will it take to reach 0? Convince me.</p> <p>I am going to count backwards in twos from 20. How many steps will it take to reach 0? Convince me.</p>	
11	13	12	14	15															
81	85	83	84	82															
13	16	15	14	17															
<p>N2</p>	<p>Count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s</p>	<p>Use explaining / justifying / convincing / proving e.g:</p> <div data-bbox="667 596 1216 826" style="border: 1px solid black; padding: 5px;"> <p>Alin says, 'If I start at 5 and count in fives I will say the number 100.' Is he correct?</p> <p>Explain your reasoning.</p> <p>Sita says, 'If I start at 17 and count in twos I will say the number 28.' Is she correct?</p> <p>Explain your reasoning.</p> </div> <div data-bbox="667 1003 1055 1233" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p>Complete these by using your own numbers.</p> <p><input type="text"/> is 5 less than <input type="text"/></p> <p><input type="text"/> is 2 less than <input type="text"/></p> </div>	<div data-bbox="1256 596 1677 826" style="border: 1px solid black; padding: 5px;"> <table border="1" data-bbox="1267 604 1458 660"> <tr> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> </table> <p>Use two of the digit cards to make a number greater than 50. Use two of the digit cards to make a number less than 30. Use two of the digit cards to make an odd/even number. Use two of the digit cards to make a number between 47 and 59. What is the smallest 2-digit number you can make? What is the largest 2-digit number you can make? Explain your reasoning.</p> </div> <div data-bbox="1106 1003 1480 1233" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p>Henry thinks of a number. 5 more than his number is 16. What is his number?</p> <p>Mohsin thinks of another number. 10 more than his number is 87. What is his number?</p> <p>Ellie thinks of a number. 2 less than her number is 34. What is her number?</p> </div>	2	3	4	5	6	<p>Finding the most efficient way of finding a solution e.g:</p>										
2	3	4	5	6															


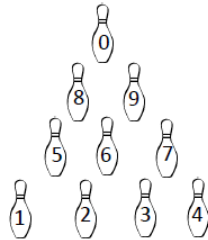
		<p>Look at the following cards:</p> <div style="display: flex; justify-content: center; gap: 5px;"> <div style="background-color: #4a7ebb; color: white; padding: 2px 5px; border: 1px solid white;">6</div> <div style="background-color: #4a7ebb; color: white; padding: 2px 5px; border: 1px solid white;">7</div> <div style="background-color: #4a7ebb; color: white; padding: 2px 5px; border: 1px solid white;">5</div> <div style="background-color: #4a7ebb; color: white; padding: 2px 5px; border: 1px solid white;">4</div> <div style="background-color: #4a7ebb; color: white; padding: 2px 5px; border: 1px solid white;">2</div> </div> <p>Make up two, 2-digit numbers. Show two numbers that are more or less than 10 apart. Show two numbers that are more or less than 5 apart.</p>
<p>N3</p>	<p>Given a number, identify 1 more and 1 less</p>	<p>Finding the most efficient way of finding a solution & working independently (mentally)</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Complete these with your own numbers:</p> <div style="margin-bottom: 10px;"> <input style="width: 40px; height: 20px; border: 1px solid #4a7ebb;" type="text"/> is one more than <input style="width: 40px; height: 20px; border: 1px solid #4a7ebb;" type="text"/> </div> <div style="margin-bottom: 10px;"> <input style="width: 40px; height: 20px; border: 1px solid #4a7ebb;" type="text"/> is one more than <input style="width: 40px; height: 20px; border: 1px solid #4a7ebb;" type="text"/> </div> <div> <input style="width: 40px; height: 20px; border: 1px solid #4a7ebb;" type="text"/> is one less than <input style="width: 40px; height: 20px; border: 1px solid #4a7ebb;" type="text"/> </div> </div> <div style="width: 50%; background-color: #e6f2ff; padding: 5px;"> <p>Hamid thought of a number. One more than his number is 19. What was his number?</p> <p>Trudy thought of a number. One less than her number is 56. What was her number?</p> </div> </div> <div style="margin-top: 20px; background-color: #e6f2ff; padding: 5px;"> <p>Harry thought of a 2-digit number. It was less than 70 but more than 40. One more than his number finished with a 6 in the unit and one less than his number finished with a 4 in the unit. What could the number be?</p> <p>Now make up some similar questions for your friends to answer.</p> </div> <div style="margin-top: 20px; border: 1px solid black; padding: 5px;"> <p>Gemma thought of a number. One more than her number was 18. What was her number?</p> <p>Gemma thought of a number. Ten more than her number was 67. What was her number?</p> <p>Gemma thought of a number. Ten less than her number was 71. What was her number?</p> </div>
<p>N4</p>	<p>Identify and represent numbers using objects and pictorial representations including the number line, and use the</p>	

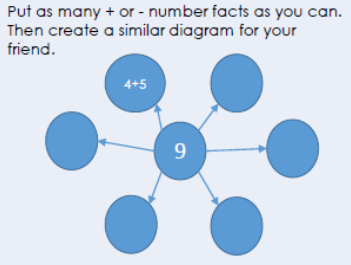

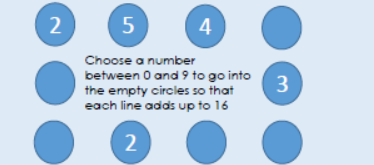
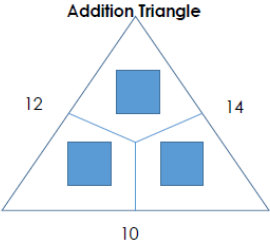
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<p>N5</p>	<p>Read and write numbers from 1 to 20 in numerals and words</p>	<p>Finding the most efficient way of finding a solution.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Write the answers to this puzzle in words: ONE, TWO, THREE</p>  <table border="0" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">Across</th> <th colspan="2">Down</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>9-7</td> <td>2</td> <td>9-8</td> </tr> <tr> <td>3</td> <td>4+2</td> <td>3</td> <td>4+3</td> </tr> <tr> <td>4</td> <td>10+1+1</td> <td>4</td> <td>5+8-3</td> </tr> <tr> <td>5</td> <td>3+5+1</td> <td></td> <td></td> </tr> </tbody> </table> </div> <div style="width: 45%; background-color: #e6f2ff; padding: 5px;"> <p>Which written numbers between 0 and 20 end with 'teen'? Make a list of them.</p> <p>Word Search</p> <table border="1" style="font-family: monospace; font-size: 0.8em;"> <tr><td>t</td><td>h</td><td>i</td><td>r</td><td>t</td><td>e</td><td>e</td><td>n</td><td></td><td>t</td></tr> <tr><td>e</td><td></td><td></td><td></td><td></td><td></td><td>f</td><td>i</td><td></td><td>w</td></tr> <tr><td>n</td><td></td><td></td><td>z</td><td>e</td><td>r</td><td>o</td><td>n</td><td></td><td>o</td></tr> <tr><td>t</td><td>w</td><td>e</td><td>n</td><td>t</td><td>y</td><td>u</td><td>e</td><td></td><td></td></tr> <tr><td></td><td>h</td><td></td><td></td><td></td><td></td><td>r</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>r</td><td>s</td><td>i</td><td>x</td><td>t</td><td>e</td><td>e</td><td>n</td></tr> <tr><td>o</td><td>n</td><td>e</td><td>e</td><td></td><td></td><td></td><td>s</td><td>i</td><td>x</td></tr> <tr><td></td><td></td><td></td><td></td><td>e</td><td>i</td><td>g</td><td>h</td><td>t</td><td></td></tr> <tr><td>n</td><td>i</td><td>n</td><td>e</td><td>t</td><td>e</td><td>e</td><td>n</td><td></td><td></td></tr> <tr><td>f</td><td>i</td><td>v</td><td>e</td><td>t</td><td>w</td><td>e</td><td>l</td><td>v</td><td>e</td></tr> </table> <p>How many written numbers (0-20) can you find?</p> </div> </div>	Across		Down		1	9-7	2	9-8	3	4+2	3	4+3	4	10+1+1	4	5+8-3	5	3+5+1			t	h	i	r	t	e	e	n		t	e						f	i		w	n			z	e	r	o	n		o	t	w	e	n	t	y	u	e				h					r						r	s	i	x	t	e	e	n	o	n	e	e				s	i	x					e	i	g	h	t		n	i	n	e	t	e	e	n			f	i	v	e	t	w	e	l	v	e
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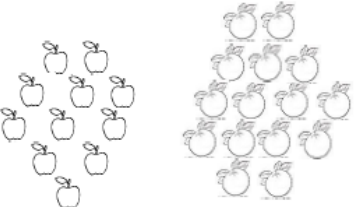
Addition and Subtraction

Code	POS - Expected	Greater Depth
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<p>CI</p>	<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p>	<p>Finding the most efficient way of finding a solution.</p> <p>A number that has 5 taken away from it is 8. What was my original number? Record using appropriate signs.</p> <p>A number that has 8 added to it is 14. What was my original number? Record using appropriate signs.</p> <p>Find as many ways as possible to show a number or calculation.</p> <p>Taking the numbers 2, 4, 3, 5, 7 and 8 and the signs + - and =. How many different number sentences can you make up?</p> <p>One is done for you.</p> $8 - 4 = 4$ <p>Record all your answers accurately.</p> <p>Explain what the same is or different about two numbers or calculations.</p> <p>Explain what is the same and different about the following number sentences:</p> $4 + 3 = 7$ $7 = 4 + 3$ <p>and,</p> $7 - 4 = 3$ $3 = 7 - 4$ <p>Asking their own mathematical questions and following their own lines of enquiry</p> <p>Look at the following sequences. What rule has been used to complete the sequences:</p> <p>3, 5, 4, 6, 5, 7, 6, 8, 7</p> <p>5, 10, 8, 13, 11, 16, 14, 19, 17</p> <p>Now make up some of your own to give to your friends.</p>
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<p>C2</p>	<p>Represent and use number bonds and related subtraction facts within 20</p>	<p>Finding the most efficient way of finding a solution.</p> <p>A number that has 7 taken away from it is 8. What was my original number? Record appropriately.</p> <p>A number that has 9 added to it is 16. What was my original number? Record appropriately.</p> <p>Find as many ways as possible to show a number or calculation.</p> <div data-bbox="680 740 1102 970">  <p>A dartboard has numbers 1 to 10. You have two darts. Set out all possible combinations, including both darts scoring the same. Set out your answers in a logical order.</p> </div> <div data-bbox="1285 593 1491 833">  <p>A player knocks down 2 pins with each throw. Can you set out all possible combinations of scores, eg, 9 and 0. Try to organise your results in a logical order.</p> </div>
<p>C3</p>	<p>Add and subtract one-digit and two-digit numbers to 20, including 0</p>	<p>Find as many ways as possible to show a number or calculation.</p>


		<p>Put as many + or - number facts as you can. Then create a similar diagram for your friend.</p>  <p>I have 3 dice (1 to 6). Show three ways I can lay out the dice so that the numbers on top add up to 15.</p>   <p>Now make your own.</p> <p>Finding the most efficient way of finding a solution.</p> <p>Helen went to play with Cybel. Helen had 10 stickers and she gave Cybel 4 of them. Cybel already had 4 stickers. Which of the two girls had most stickers to play with?</p> <p>Harry had 17 football cards. He wanted to give some to his friend Hamid. After giving them to Hamid, Harry had 3 more than Hamid. How many did each boy have?</p> <p>Addition Triangle</p>  <p>What numbers are missing from the squares inside the triangle?</p>
C4	Solve one-step problems that involve addition and subtraction, using concrete objects and	Finding the most efficient way of finding a solution.

	<p>pictorial representations, and missing number problems such as</p> $7 = ? - 9$	<p>Harry and Fatima have their birthday in the same month.</p> <p>Harry's birthday is on the second day of the month and Fatima's birthday is on the 14th day of the month.</p> <p>Which of the two is older?</p> <p>How many days are there between the two birthdays?</p> <p>John has 4 football stickers and Hamza has 8 football stickers.</p> <p>They are all different stickers. They have a special book to put in their stickers. In total there are 20 stickers to collect.</p> <p>How many more stickers do they need to fill their book?</p>	 <p>Look at the apples and oranges above.</p> <p>How many apples and oranges are there altogether?</p> <p>How many more oranges are there than apples?</p> <p>If we ate 5 oranges and 3 apples, how many pieces of fruit would there be left?</p>
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Multiplication and Division

Code	POS - Expected	Greater Depth
C5	<p>Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the</p>	<p>Use explaining / justifying / convincing / proving</p> <p>Hamid has 20 sweets altogether.</p> <p>He has four friends coming to tea. Is he able to share the sweets between himself and his friends so that they all have the same amount?</p> <p>Show how you have done your calculations.</p>

	support of the teacher	<p>Find as many ways as possible to show a number or calculation.</p> <div data-bbox="683 284 1034 499" style="background-color: #e0f0ff; padding: 5px;"> <p>Hannah's Toy Box</p> <p>In Hannah's toy box she has cars (with 4 wheels) and bikes (with 2 wheels)</p> <p>Altogether there are 18 wheels.</p> <p>Work out how many cars and bikes could have been in the toy box. There has to be at least 1 car and 1 bike.</p> </div> <div data-bbox="1097 292 1603 507" style="border: 1px solid black; padding: 5px;"> <p>Using only 2p, 5p and 10p coins, can you show 20p?</p> <p>In how many different ways can you do this?</p> <p>Are you sure you have got them all?</p> <p>Explain how you know.</p> </div> <p>Finding the most efficient way of finding a solution.</p> <div data-bbox="683 590 1012 804" style="background-color: #e0f0ff; padding: 5px;"> <p>I buy cup cakes which cost 5p each.</p> <p>I have 20p. Am I able to buy 5 cup cakes?</p> <p>I have 10p. Am I able to buy 2 cup cakes?</p> <p>I have 16p. Am I able to buy 3 cup cakes. What do you notice?</p> <p>Make up some problems for your friends but this time the cup cakes will cost 4p.</p> </div> <div data-bbox="1064 590 1424 804" style="background-color: #e0f0ff; padding: 5px;"> <p>Sharing sweets with friends</p> <p>If Hamid had 20 sweets altogether would he be able to share them equally if he had 3 friends coming? (Don't forget Hamid's share)</p> <p>What about if 2 friends were coming?</p> <p>How about five friends?!</p> </div>
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		<p>Coloured pencils</p> <p>5 girls each have a set of 5 pencils made up of 2 red; 1 yellow; 1 blue and 1 green. How many red and blue pencils do the 5 girls have altogether?</p>	<p>Chocolate Bars</p> <p>With my 50p pocket money I bought chocolate bars for 5p each. I have 20p left. How many chocolate bars did I buy?</p>	
		<p>Chocolate and Raspberry Milk Shakes</p> <p>3 children, Jake, India and Tom, share out chocolate and raspberry milk shakes. Jake only likes chocolate milk shakes. They all end up with 4 milk shakes each. India and Tom have the same amount of raspberry and chocolate milk shakes. How many chocolate milk shakes are there altogether?</p>	<p>Trees in the school</p> <p>There are a number of trees in the school grounds. Each tree drops 5 leaves each day. How many trees are there if we find 25 leaves on the ground each day?</p> 	
		<p>Lollies cost 5p each. A pack of 3 lollies costs 13p.</p> <p>How much money do you save when you buy a pack of 3 lollies instead of 3 single lollies?</p>		

Fractions

Code	POS - Expected	Greater Depth	
F1	Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity	<p>Finding the most efficient way of finding a solution.</p> <p>Harry went to play with Ahmed. Ahmed had 10 cars and he gave Harry half of them. Harry already had 2 cars. How many cars did Harry have to play with?</p>	<p>A bowl of fruit on a table contained apples, pears, oranges and bananas. One half of all the fruit in the bowl was apples. There were 2 pears; 3 oranges and 5 bananas. How many pieces of fruit were there altogether?</p>

Sam and Ellen were given a bowl of smarties.
 There were 4 colours altogether.
 Half of all the smarties were red, 5 were yellow, 2 were blue and 3 were green.
 How many smarties were there altogether?

Use explaining / justifying / convincing / proving

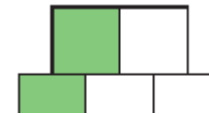
Exactly half the girls at a dance were girls.
 How many children could there have been at the dance?
 Put a circle around the number that could have been at the dance.

12 13 15 20 8 7 5 9 18

Explain your reasons.

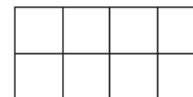
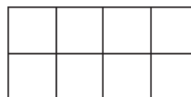
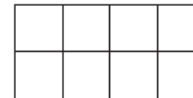
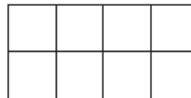
What fraction of the whole shape is shaded?

Explain your reasoning.




Find as many ways as possible to show a number or calculation.


Shade each whole shape to show half in four different ways.



Half the children at a party are girls.
 How many children could be at the party?
 Give four different answers.

Explain your reasoning.

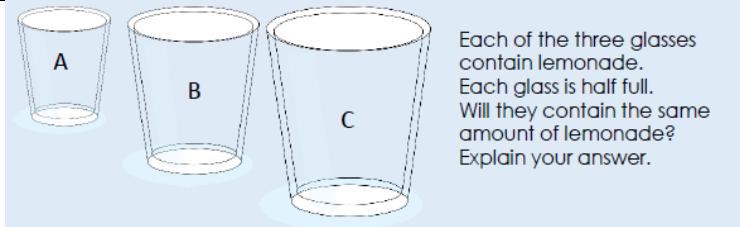
<p>F2</p>	<p>Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity</p>	<p>Use explaining / justifying / convincing / proving</p> <div data-bbox="860 292 1296 517" style="border: 1px solid black; padding: 5px; background-color: #e6f2ff;"> <p>Exactly a quarter of the gymnastics club were boys. How many children could there have been at the gymnastics club? Put a circle around the number that could have been at the gymnastics club.</p> <p>13 15 20 8 7 5 9 18 12</p> <p>Explain your reasons.</p> </div> <div data-bbox="1319 292 1830 558" style="border: 1px solid black; padding: 5px;"> <p>What fraction of the whole shape is shaded?</p> <p>Explain your reasoning.</p>  </div> <div data-bbox="860 606 1780 719" style="border: 1px solid black; padding: 5px;"> <p>Four children share two bags of 8 marbles equally. Draw a diagram to show how many marbles each child gets.</p> <p>What fraction of one bag of marbles does each child get?</p> </div> <p>Explain why a statement is correct or wrong.</p> <div data-bbox="851 786 1296 1011" style="border: 1px solid black; padding: 5px; background-color: #e6f2ff;"> <p>If 3 children share 6 apples between them. They will all have 1 apple each. Yes / No</p> <p>If 4 children each have a quarter of a cake. There will be no cake left. Yes / No</p> <p>If I give 3 children a quarter of all the sweets then there will be none left. Yes / No</p> </div> <p>Finding the most efficient way of finding a solution.</p>
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		<p>Taking a quarter away</p> <p>If I take a quarter of the number away I am left with 12. How much was the number in the first place?</p>	 <p>Four children share a bowl of fruit so that they all have the same amount. There are 8 apples; 4 oranges; 2 bananas and 1 pear.</p>																										
		<p>Ahmed's Cars</p> <p>Harry went to play with Ahmed. Ahmed had 10 cars and he gave Harry half of them. Harry already had 2 cars. How many cars did Harry have to play with?</p>	<p>Use the table below to show how much each child got.</p> <table border="1"> <thead> <tr> <th></th> <th>Apples</th> <th>Pears</th> <th>Bananas</th> <th>Oranges</th> </tr> </thead> <tbody> <tr> <td>Child 1</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Child 2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Child 3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Child 4</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Apples	Pears	Bananas	Oranges	Child 1					Child 2					Child 3					Child 4					
	Apples	Pears	Bananas	Oranges																									
Child 1																													
Child 2																													
Child 3																													
Child 4																													
		<p>Josh and Francesca were given a bowl of smarties.</p> <p>There were 4 colours altogether.</p> <p>A quarter of all the smarties were red, 7 were yellow, 5 were blue, and 3 were green. How many smarties were there altogether?</p>	<p>Breakfast time</p> <p>12 children on a holiday camp went for breakfast. A quarter of the group chose Rice crispies; 5 chose Corn Flakes and the others chose Weetabix. How many chose to have Weetabix for breakfast?</p>																										
		<p>Asking their own mathematical questions and following their own lines of enquiry</p> <p>A bowl of fruit holds 20 pieces of fruit.</p> <p>It had 3 bananas; 5 apples; 6 oranges; 4 pears and 2 kiwi fruits.</p> <p>If you wanted a quarter of the bowl to hold bananas, how many bananas would you need? Which fruit would you take out?</p>																											

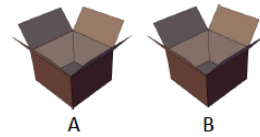
Measurement

Code	POS - Expected	Greater Depth
MI a	<p><u>Length:</u></p> <p>Compare, describe and solve practical lengths and heights problems: long/short, longer/shorter, tall/short, double/half</p> <p>Measure and begin to record the lengths and heights</p>	<p>Asking their own mathematical questions and following their own lines of enquiry</p> <div data-bbox="745 419 1547 951"> </div> <div data-bbox="745 991 1346 1206"> <p>A long brick is twice the length of a short brick.</p> <p>Which is longer:</p> <p>2 long bricks or 3 short bricks?</p> <p>3 long bricks or 5 short bricks?</p> </div>
MI b	<p><u>Capacity and Volume:</u></p>	<p>Use explaining/ justifying/ convincing/ proving</p>

Compare, describe and solve practical capacity and volume problems: full/empty, more than, less than, half, half full, quarter



If Glass B holds twice as much as Glass A and Glass C holds twice as much as Glass B, will a full Glass A and a full Glass B fill Glass C? Explain your answer.



If two identical boxes are filled with different materials, will they weigh the same? Box A is filled with bars of chocolate and Box B is filled with bars of metal which are exactly the same shape and size as the bars of chocolate. Which box will have most bars? Which box will be the heaviest? Explain your answer/how you know?



Consider the 3 food storage containers here. How can you find out how many of container 1 will fit into container 2? and How many of container 1 will fit into container 3? Explain your ideas.

Measure and begin to record the capacity / volume

		<div data-bbox="1290 197 1505 400" data-label="Image"> </div> <div data-bbox="1296 411 1464 587" data-label="Image"> </div> <div data-bbox="1518 204 1675 571" data-label="Text"> <p>Take a number of bottles of different sizes and shapes. If you have a measuring jug, how would you go about working out which of the bottles has a greatest capacity and which has the smallest capacity?</p> </div> <div data-bbox="1294 628 1648 699" data-label="Text"> <p>Set your answer out on a chart, don't forget to estimate first. Explain your thinking.</p> </div> <div data-bbox="741 740 1290 772" data-label="Text"> <p>Find all the possible numbers that satisfy criteria.</p> </div> <div data-bbox="741 801 1330 833" data-label="Text"> <p>Finding the most efficient way of finding a solution.</p> </div> <div data-bbox="752 868 1160 1168" data-label="Text"> <p>Using the terms capacity and volume accurately Using measuring jugs pupils should rehearse saying that the jug has a capacity of (however much it can hold). Put water into each jug but do not fill the jug. Measure how much water there is inside. Rehearse saying that the volume of water in the jug is (whatever the measure says). Pupils should know that the capacity is the amount it could hold and the volume is the amount inside the jug.</p> </div> <div data-bbox="1232 865 1671 1171" data-label="Complex-Block"> <div data-bbox="1236 868 1666 900" data-label="Text"> <p>Dave has a 1 litre and a 2 litre bottle. He pours the water from the small bottle into the large bottle.</p> </div> <div data-bbox="1236 912 1509 932" data-label="Text"> <p>Mark where the water comes to on the large bottle.</p> </div> <div data-bbox="1245 960 1585 1161" data-label="Image"> </div> </div>
MI	<u>Mass / Weight:</u>	Finding the most efficient way of finding a solution.

Compare, describe and solve practical mass / weight problems::
heavy/light, heavier than, lighter than

Measure and begin to record the mass / weight

Use the balancing scales.
Provide pupils with 3 or 4 items of similar mass.
Get them to use the balancing scales to find out which is the lightest, heaviest, etc.



Practical Activity:
Provide pupils with two bags of sand with different amounts in each.
Pupils to use balances and move sand from one bag to the other so as to ensure that there is the same amount of sand in both bags.
This is mainly aimed at helping pupils to use the balances and aim for accuracy.

Look at these balance scales. There are five cars on one side. The doll weighs the same as how many cars?

Explain why a statement is correct or wrong.

Which of these statements is true?

- The dinosaur is lighter than the robot.
- The robot is lighter than the dinosaur.
- The dinosaur and robot weigh the same.

Explain your reasoning.

		<p>Find 2 buckets of the same size.</p> <p>Fill one with sand and fill the other with water (any two substances that will end up weighing differently will do).</p> <p>Explain why one weighs more than the other.</p> <p>Use explaining/ justifying/ convincing/ proving</p> <p>Look at items that are sold in a supermarket.</p> <p>Recognise that some are sold in packets by weight.</p> <p>Find 5 items that are sold by weight, eg, sugar.</p> <p>Record them and explain why they may be sold in these sizes.</p> <p>Find a range of items to complete this table:</p> <table border="1" data-bbox="750 837 1108 1013"> <thead> <tr> <th></th> <th>Weights less than 1Kg</th> <th>Weights more than 1Kg</th> </tr> </thead> <tbody> <tr> <td>Is less than 1m</td> <td></td> <td></td> </tr> <tr> <td>Is between 1m and 5m</td> <td></td> <td></td> </tr> <tr> <td>Is more than 5m.</td> <td></td> <td></td> </tr> </tbody> </table> <p>Look at the buildings above. Why is it that the tallest building is not always the one with most rooms?</p> <p>Explain why the heaviest item is not always the longest. Justify your answer.</p> <p>You have an adult and a child together. They both move forward 5 steps. Which is more likely to have moved the furthest?</p> <p>Explain your thinking.</p> <p>Explain why we need standard measures for measuring length and weight.</p> <p>Justify your reasoning with examples.</p>		Weights less than 1Kg	Weights more than 1Kg	Is less than 1m			Is between 1m and 5m			Is more than 5m.		
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M1 d	<u>Time:</u>	Finding the most efficient way of finding a solution.												

Compare, describe and solve practical time problems:
quicker, slower, earlier, later

Measure and begin to record time (hours, minutes, seconds)

On the way to a football match Harry's parents and Harry spent 30 minutes in the car. They then walked for another 20 minutes to reach the ground.

Did the journey take more or less than 1 hour?

How many minutes did the journey take?

We go and visit our grandmother each day. On Monday the journey took 2 hours; On Tuesday there was a lot of traffic and it took 3 hours but on Wednesday it only took us 1 hour.

On which day did it take the longest time to get to grandmother?

On which day did it take the shortest time to get to grandmother?

How much difference is there between Tuesday's journey and Wednesday's journey?

Here are some clocks where the minute hand has broken off. Use the hour hand to work out what time it is.



Asking their own mathematical questions and following their own lines of enquiry



Think of the story of the Three Bears.

Think of the time that the Three Bears decided to go for a walk in the wood.

Write down three things that happened later in the story.



Think of the story of Cinderella


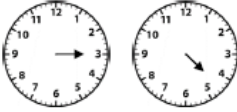
Think of the time when the fairy Godmother helps Cinderella get ready for the ball.

Think of 3 things that happened earlier in the story.

Use explaining/ justifying/ convincing/ proving


		<p>I walk to school every day. On Monday my journey takes 10 minutes. On Tuesday I walk more slowly. Does my journey take more or less time than on Monday?</p> <p>Explain your answer.</p> <p>On Wednesday it takes me 8 minutes to walk to school. On which of the 3 days do I walk quickest? On which of the 3 days do I walk slowest?</p> <p>Explain your reasoning.</p>												
M2	Recognise and know the value of different denominations of coins and notes	<p>Find as many ways as possible to show a number or calculation.</p> <table border="1" data-bbox="745 675 1397 903"> <tr> <td data-bbox="745 675 1055 703">Show two ways of paying 55p</td> <td data-bbox="1055 675 1397 703">Ella has 2 different silver coins.</td> </tr> <tr> <td data-bbox="745 735 1055 764">Show two ways to pay 75p</td> <td data-bbox="1055 735 1397 764">What is the smallest amount she could have?</td> </tr> <tr> <td data-bbox="745 796 1055 825">Show three ways of paying 29p</td> <td data-bbox="1055 796 1397 825">What is the most that she could have?</td> </tr> <tr> <td data-bbox="745 857 1055 885"></td> <td data-bbox="1055 857 1397 885">What is the smallest and the most she could have if the 2 coins do not have to be different?</td> </tr> </table> <p>Finding the most efficient way of finding a solution.</p> <table border="1" data-bbox="745 1026 1570 1150"> <tr> <td data-bbox="745 1026 1570 1054">A bar of chocolate costs 10p.</td> </tr> <tr> <td data-bbox="745 1054 1570 1083">A shop offers a special price if you buy 3 chocolate bars. 3 bars will cost 25p.</td> </tr> <tr> <td data-bbox="745 1106 1570 1134">How much money do you save by buying three bars?</td> </tr> </table> <p>Use explaining/ justifying/ convincing/ proving</p>	Show two ways of paying 55p	Ella has 2 different silver coins.	Show two ways to pay 75p	What is the smallest amount she could have?	Show three ways of paying 29p	What is the most that she could have?		What is the smallest and the most she could have if the 2 coins do not have to be different?	A bar of chocolate costs 10p.	A shop offers a special price if you buy 3 chocolate bars. 3 bars will cost 25p.	How much money do you save by buying three bars?	
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How much money do you save by buying three bars?														


		<p>Amjal has only 2p, 5p and 10p coins.</p> <p>Can he pay 21p without needing change? Show how he can do this. Is it possible to do this in more than 1 way? Show your workings.</p>																																																																											
M3	<p>Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</p> <p>Recognise and use language relating to dates, including days of the week, weeks, months and years</p>	<p>Asking their own mathematical questions and following their own lines of enquiry</p> <div data-bbox="743 389 1393 616"> <table border="1"> <thead> <tr> <th colspan="7">March</th> </tr> <tr> <th>Sun</th> <th>Mon</th> <th>Tues</th> <th>Wed</th> <th>Thu</th> <th>Fri</th> <th>Sat</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> <td>11</td> <td>12</td> </tr> <tr> <td>13</td> <td>14</td> <td>15</td> <td>16</td> <td>17</td> <td>18</td> <td>19</td> </tr> <tr> <td>20</td> <td>21</td> <td>22</td> <td>23</td> <td>24</td> <td>25</td> <td>26</td> </tr> <tr> <td>27</td> <td>28</td> <td>29</td> <td>30</td> <td>31</td> <td></td> <td></td> </tr> </tbody> </table> <p>Look at the calendar which shows the days in March. There are five days coloured in when Hussain has special events.</p> <p>Hussain has a dental appointment on a Tuesday. Which date is this? Hussain has a party on a weekend. Which date is this? Hussain's mother's birthday is at the beginning of the month. Which date is this? Hussain and his friends go bowling on a Friday evening. Which date is this?</p> </div> <p>Find as many ways as possible to show a number or calculation.</p> <div data-bbox="743 735 1440 962"> <p>The following table outlines Jemma's day from 8 in the morning to 8 at night.</p> <table border="1"> <thead> <tr> <th>8</th> <th>9</th> <th>10</th> <th>11</th> <th>12</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>Get Up</td> <td>Have breakfast</td> <td></td> <td></td> <td>Have Lunch</td> <td></td> <td>Meet my friend</td> <td></td> <td>Watch TV</td> <td></td> <td>Have Tea</td> <td></td> <td>Go to Bed</td> </tr> </tbody> </table> <p>Make up as many sentences as you can that involve the words: before, after, next, and later.</p> </div>	March							Sun	Mon	Tues	Wed	Thu	Fri	Sat			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			8	9	10	11	12	1	2	3	4	5	6	7	8	Get Up	Have breakfast			Have Lunch		Meet my friend		Watch TV		Have Tea		Go to Bed
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M4	<p>Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times</p>	<p>Finding the most efficient way of finding a solution.</p>																																																																											




		<p>Ajmal leaves home to go the cinema at 5 o'clock, Helen leaves one hour later. Which of these clocks shows the time Helen left home?</p>   <p>These two clocks have had their minute hand broken off. Work out what the time should be anyway.</p>	<p>Harry and his dad go to a football match at 2 o'clock. Hamid leaves to go to the same game half an hour after Harry. Theo and his sister Rachel leave half an hour before Harry. Match the people to times they left home:</p> <table border="0"> <tr> <td>Harry</td> <td>half past one</td> </tr> <tr> <td>Hamid</td> <td>two o'clock</td> </tr> <tr> <td>Theo and Rachel</td> <td>half past two</td> </tr> </table>	Harry	half past one	Hamid	two o'clock	Theo and Rachel	half past two	
Harry	half past one									
Hamid	two o'clock									
Theo and Rachel	half past two									

Find clocks and watches and see if you can work out what the times are – o'clock and half past – on real watches and clocks.

Geometry – Properties of Shape

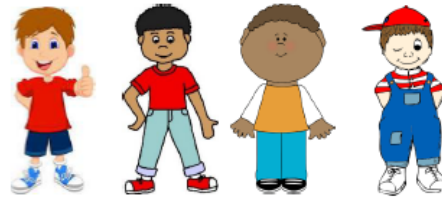
Code	POS - Expected	Greater Depth
G1	<p>Recognise and name 2-D shapes [for example, rectangles (including squares), circles and triangles]</p>	<p>Use explaining / justifying / convincing/ proving</p> <p>Play the 'odd one out' game.</p>  <p>By using descriptive language, give a reason why each of these shapes could be the odd one out.</p>

		<p>Asking their own mathematical questions and following their own lines of enquiry</p> <p>Pupils could create their own game of 'snap' by creating cards with different shapes and cards with descriptions on, eg. 3 sides; 4 corners, etc.</p> <p>The shape must be partnered with a description to create a snap.</p> <p>Get pupils working in pairs. One has to describe a 2D shape to another by using descriptive language such as 4 corners, etc. The partner has to try and draw the shape being described on a piece of paper or their workbook. At the end get them to check together and discuss what went well and what did not go well. Then change roles.</p> <p>Take one shape and draw 3 of these shapes in different orientation. Example - triangles</p>  <p>Other examples are rectangles; squares and circles.</p>
G2	Recognise and name 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	Asking their own mathematical questions and following their own lines of enquiry

		<p>What shapes do the following tend to be:</p> <table border="1"> <thead> <tr> <th>Item of Object</th> <th>Shape</th> </tr> </thead> <tbody> <tr> <td>Soft drink</td> <td></td> </tr> <tr> <td>Tennis Ball</td> <td></td> </tr> <tr> <td>Dice</td> <td></td> </tr> <tr> <td>Bar of Chocolate</td> <td></td> </tr> </tbody> </table> <p>Draw a very interesting house using only:</p> <p>Triangles</p> <p>Circles</p> <p>Rectangles</p> <p>Squares</p> <p><i>Your house should be made up of bricks; include 4 windows, roof, chimney and a door.</i></p> <p>Now give your partner a challenge to create another drawing.</p>	Item of Object	Shape	Soft drink		Tennis Ball		Dice		Bar of Chocolate		<p>Think of a car:</p> <p>Name any 2D or 3D shapes in a typical car.</p>  <p>Think of a bicycle:</p> <p>Name as many 2D or 3D shapes you can see on a bicycle.</p>  <p>Think of your kitchen at home:</p> <p>Name as many 2D or 3D shapes you can see in a your kitchen.</p> 
Item of Object	Shape												
Soft drink													
Tennis Ball													
Dice													
Bar of Chocolate													

Geometry – Position and Direction

Code	POS - Expected	Greater Depth
PI	Describe position, direction and movement, including whole, half, quarter and three-quarter turns	Find as many ways as possible to show a number or calculation.



Arthur Ben Colin Duncan

Make up as many sentences as you can about the boys' positions, using the terms: left, right, between, and next to.

One has been done for you.

Colin is to the right of Ben.



Make up as many questions as you can in relation to the position of various items in the table. Two have been done for you:

- The elephant is to the left of the snake.
- The boy is above the dart board

Identify the position of each object. Top, middle or bottom, first, second, third, fourth or fifth. To the left or right.



Your partner thinks of an object from the grid.

You can ask your partner up to 4 questions, using the language above.

Your partner has to answer with a yes or no.

Pupils to set up their own objects in a circle and invite pupils to go into the middle and then ask them to turn using the terms: quarter; half; full; three-quarters; left and right.

On the school playground or the school field, pupils mark out North, East, South and West. Pupils to instruct others to make turns. This time the pupils describe what they will see when they make a turn. The partner needs then to respond by saying that they turned a quarter to the left, etc.

Year 2 Objectives

Expected

Greater Depth

Place Value

count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward

Asking their own mathematical questions and following their own lines of enquiry.

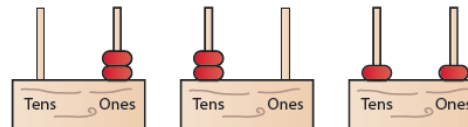
Here is part of a number square.
What is the largest number on the whole square?

3	6	9	12	15
18	21	24	27	
33	36	39		
48	51	54		
63	66			

recognise the place value of each digit in a two-digit number (tens, ones)

Find all the possible numbers that satisfy criteria.

If you put 2 beads onto a tens/ones abacus you can make the numbers 2, 20 and 11.






Do the same with 3 beads. How many different numbers can you make?


How many different numbers can you make using 4 beads?

identify, represent and estimate numbers using different representations, including the number line


Explain what is the same or different about two numbers or calculations.

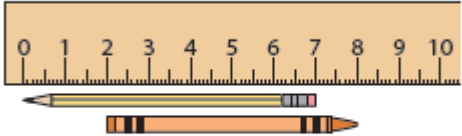
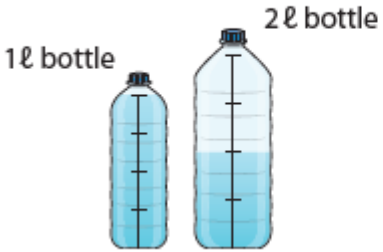
	<p>Place 47 on each of these empty number lines.</p> <p>_____</p> <p>0 100</p> <p>_____</p> <p>40 60</p> <p>_____</p> <p>33 50</p>																				
<p>compare and order numbers from 0 up to 100; use <, > and = signs</p>	<p>Find as many ways as possible to show a number or calculation. Use < > and = signs to make these number sentences correct.</p> <p>3 tens and 2 ones <input type="checkbox"/> 2 tens 12 ones</p> <p>4 tens and 3 ones <input type="checkbox"/> 3 tens 14 ones</p> <p>5 tens and 4 ones <input type="checkbox"/> 4 tens 11 ones</p>																				
<p>read and write numbers to at least 100 in numerals and in words</p>	<p>Use explaining>justifying>convincing>proving.</p> <div style="border: 1px solid blue; padding: 10px; margin: 10px auto; width: fit-content;"> <p> Greater Depth Challenge:</p> <table border="1" style="border-collapse: collapse; text-align: center; width: 100%;"> <tr> <td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td> </tr> <tr> <td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td></td><td>48</td><td>49</td><td>50</td> </tr> </table> <p>Sally says the missing number is 74. Ben says it's 47. Who is right?</p> <p style="color: purple;">Explain using: tens digit, ones digit, more, less.</p> </div>	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46		48	49	50
31	32	33	34	35	36	37	38	39	40												
41	42	43	44	45	46		48	49	50												
<p>use place value and number facts to solve problems.</p>	<p>Use explaining>justifying>convincing>proving</p>																				

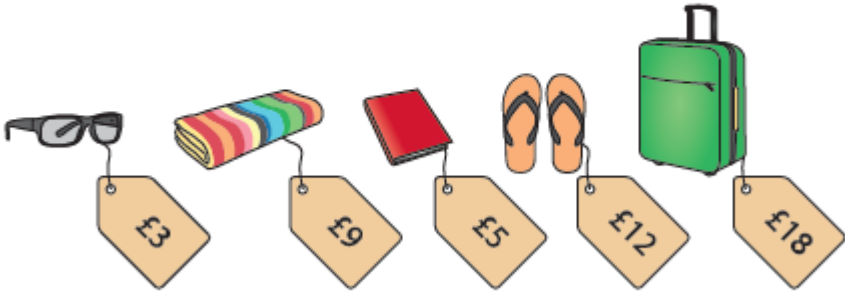
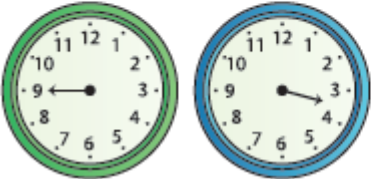
	<div style="border: 1px solid blue; padding: 10px; text-align: center;">  <p style="color: blue; margin: 0;">Greater Depth Challenge:</p> <table border="1" style="margin: 0 auto; text-align: center;"> <tr> <td>27</td><td>28</td><td>29</td><td>13</td><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td> </tr> </table> <p style="margin: 10px 0;">Sam made a mistake filling in the numbers. Find the mistake and explain why this happened.</p> </div>	27	28	29	13	31	32	33	34	35	36
27	28	29	13	31	32	33	34	35	36		
Addition and Subtraction											
<p>solve problems with addition and subtraction:</p> <p>using concrete objects and pictorial representations, including those involving numbers, quantities and measures</p> <p>applying their increasing knowledge of mental and written methods</p>	<p>Explain what is the same or different about two numbers or calculations.</p> <p>If each peg on the coat hanger has a value of 10, find three ways to partition the pegs to make the number sentences complete.</p>  <p> $\square + \square + \square = \square$ $\square + \square + \square = \square$ $\square + \square + \square = \square$ </p> <p>What is the total of each addition sentence? Will the total always be the same? Explain your reasoning.</p>										
<p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p>	<p>Finding the most efficient way of finding a solution</p> <p style="text-align: right;">Complete the calculations.</p> <p style="text-align: right;">$30 + 40 + \square = 100$</p> <p style="text-align: right;">$40 + \square + 20 = 100$</p> <p style="text-align: right;">$36 + 44 + \square = 100$</p> <p style="text-align: right;">$36 + 54 + \square = 100$</p> <p style="text-align: right;">$47 + \square + 20 = 100$</p> <p style="text-align: right;">$47 + \square + 30 = 100$</p>										

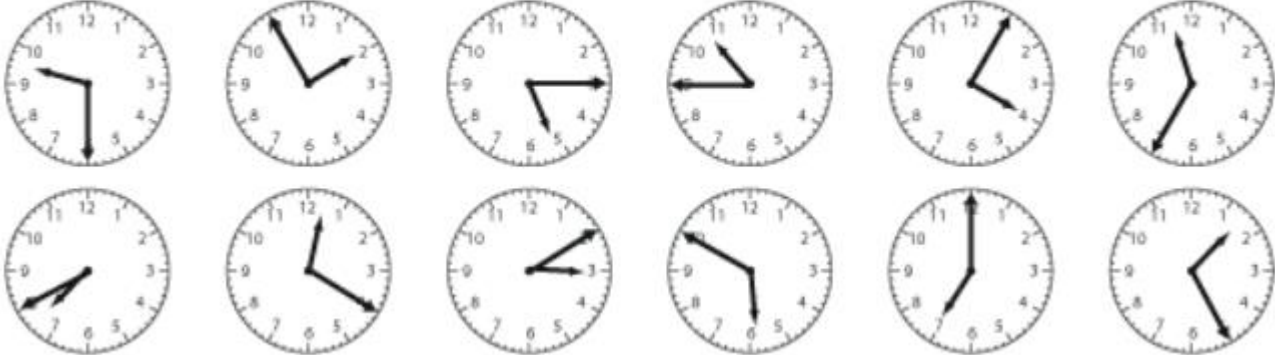
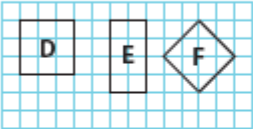

<p>add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers adding three one-digit numbers</p>	<p>Use explaining>justifying>convincing>proving</p> <p>Fill in the missing numbers. What do you notice?</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">27</td> <td style="text-align: center;">12</td> <td style="text-align: center;">15</td> </tr> <tr> <td style="text-align: center;">15</td> <td style="text-align: center;">?</td> <td style="text-align: center;">?</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">37</td> <td style="text-align: center;">23</td> <td style="text-align: center;">14</td> </tr> <tr> <td style="text-align: center;">15</td> <td style="text-align: center;">?</td> <td style="text-align: center;">?</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">13</td> <td style="text-align: center;">14</td> <td style="text-align: center;">57</td> </tr> <tr> <td style="text-align: center;">?</td> <td style="text-align: center;">?</td> <td style="text-align: center;">15</td> </tr> </table>	27	12	15	15	?	?	37	23	14	15	?	?	13	14	57	?	?	15
27	12	15																	
15	?	?																	
37	23	14																	
15	?	?																	
13	14	57																	
?	?	15																	
<p>show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</p>	<p>Use explaining>justifying>convincing>proving</p> <p>Captain Conjecture says, 'An odd number + an odd number + an odd number = an even number.' Is this sometimes, always or never true?</p> <p>Explain your reasoning.</p> <p><i>Concrete resources might help pupils to explain their reasoning.</i></p> 																		
<p>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</p>	<p>Find all the possible numbers that satisfy criteria</p> <p>Find different possibilities.</p> $\square + \square = 50$ $50 - \square = \square$																		
<p>Multiplication and Division</p>																			
<p>recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</p>	<p>Find as many ways as possible to show a number or calculation.</p>																		

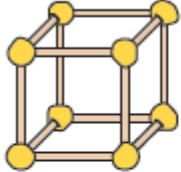
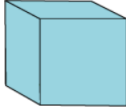
	<p>Write these addition sentences as multiplication sentences.</p> <p>$10 + 10 + 10 + 5 + 5 =$</p> <p>$2 + 2 + 2 + 4 =$</p> <p>$2 + 2 + 4 + 4 =$</p> <p>$5 + 5 + 5 + 2 + 3 =$</p>
<p>Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equal ($=$) signs</p>	<p>Explain what is the same or different about two numbers or calculations</p> <p>Which has the most biscuits: 4 packets of biscuits with 5 in each packet, or 3 packets of biscuits with 10 in each packet?</p> <p>Explain your reasoning.</p>
<p>show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p>	<p>Explain why a statement is correct or wrong</p> <p>True or false?</p> <p>$5 \times 4 = 4 \times 5$</p> <p>$5 \times 4 = 10 \times 2$</p> <p>$5 \times 4 = 2 \times 10$</p> <p>Explain your reasoning.</p> <p>What do you notice?</p>
<p>solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</p>	<p>Find all the possible numbers that satisfy criteria</p>

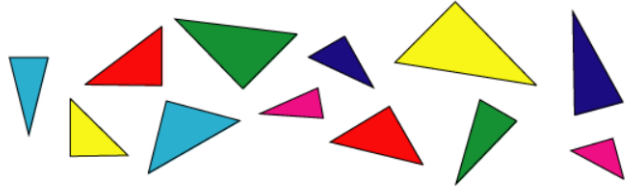

	<p>Find different ways to find the answer to 12×4.</p>  <p>Children are expected to use their 2, 5 and 10 times tables to answer this question.</p>
<p>Fractions</p> <p>recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity</p>	<p>Finding the most efficient way of finding a solution</p> <p>Jo bought a bag of cherries. Jo ate half the number of cherries in the bag. Jo had 7 cherries left. How many cherries did Jo buy?</p>
<p>write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.</p>	<p>Finding the most efficient way of finding a solution</p> <p>Complete:</p> <p>Half of \square is 6</p> <p>$\frac{2}{4}$ of \square is 6</p> <p>$\frac{1}{4}$ of \square = 5</p> <p>$\frac{3}{4}$ of \square = 15</p> <p>20 children are in a class and $\frac{1}{4}$ are girls. How many are boys?</p>
<p>Measurement</p> <p>Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}$C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels.</p>	<p>Explain what is the same or different about two numbers or calculations</p>

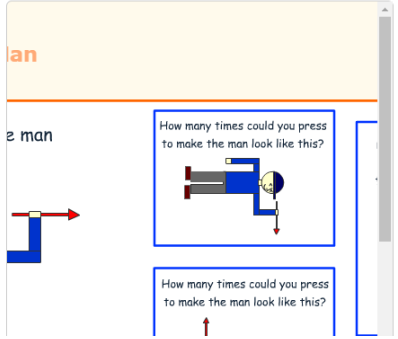












	<p>How long is the crayon?</p>  <p>The crayon is _____ cm long.</p> <p>How much longer is the crayon than the pencil?</p>
<p>Compare and order lengths, mass, volume/capacity and record the results using $>$, $<$ and $=$</p>	<p>Use explaining>justifying>convincing>proving</p> <p>Here is a picture of a 1 litre bottle and a 2 litre bottle with some water in them. What's the same? What's different?</p> 
<p>Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value.</p>	<p>Use explaining>justifying>convincing>proving</p> <p>Sam says I can make 97p using just four coins. Is he correct?</p> <p>Explain your reasoning.</p>
<p>find different combinations of coins that equal the same amounts of money</p>	<p>Find all the possible numbers that satisfy criteria</p> <p>Grace uses a £2 coin to buy a can of drink which costs 85p. She is given four coins in change.</p> <p>Find all the possible combinations of coins she could have been given.</p>

<p>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</p>	<p>Finding the most efficient way of finding a solution</p> <p>Sid says, 'I have bought 2 items for my holiday. One item cost £9 more than the other. I spent over £15.' What two items did Sid buy? The _____ and the _____.</p>  <p>Make up your own problems using the holiday items.</p>
<p>compare and sequence intervals of time</p>	<p>Explain why a statement is correct or wrong</p> <p>Jack says, 'There isn't any point in having a minute hand on a clock because I can still tell the time without it'</p> <p>Do you agree with him?</p> <p>Explain your answer.</p> 
<p>tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times</p>	<p>Explain what is the same or different about two numbers or calculations.</p>

	<p>Can you put the times on these clocks in order?</p>  <p>https://nrich.maths.org/7377</p>
<p>know the number of minutes in an hour and the number of hours in a day.</p>	
<p>Geometry</p>	
<p>identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</p>	<p>Explain why a statement is correct or wrong.</p> <p>Captain Conjecture says, 'All of these shapes are rectangles because they have four sides.'</p> <p>Do you agree?</p>  <p>Explain your reasoning.</p> <p><i>Children should appreciate that a square is a rectangle because it has 4 right angles and opposite sides are of equal length.</i></p> 
<p>identify and describe the properties of 3-</p>	<p>Asking their own mathematical questions and following their own lines of enquiry</p>




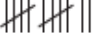


<p>D shapes, including the number of edges, vertices and faces</p>	<p>Jack has made a cube using 12 sticks and 8 balls of modelling clay.</p>  <p>What shape could he make with:</p> <p>6 sticks and 4 balls of clay?</p> <p>4 long sticks, 8 short sticks 8 balls of clay?</p>
<p>identify 2-D shapes on the surface of 3-D shapes [for example, a circle on a cylinder and a triangle on a pyramid]</p>	<p>Asking their own mathematical questions and following their own lines of enquiry</p> <h3>Cubes Cut Into Four Pieces</h3> <p>Age 5 to 7 ★★★</p> <p>Eight children sat round the big table at the end of the classroom. They each had a cube made from modelling clay.</p>  <p>"Cut your cube into four pieces which are all exactly the same shape and size," said their teacher, "and try to make your pieces different from everyone else's!"</p> <p>https://nrich.maths.org/233</p>
<p>compare and sort common 2-D and 3-D shapes and everyday objects.</p>	<p>Use explaining>justifying>convincing>proving</p>

	<h2 style="text-align: center;">Matching Triangles</h2> <p style="text-align: center;">Age 5 to 7 ★</p> <p style="text-align: center;">These triangles belong to three different families.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">All the triangles in the same family are the same shape. But they may not be the same size or the same way up.</p> <p style="text-align: center;">Can you sort them out and explain how you did it?</p> <p>https://nrich.maths.org/5638</p>
<p>order and arrange combinations of mathematical objects in patterns and sequences</p>	<p>Finding the most efficient way of finding a solution</p> <p style="text-align: center;">Fill in the missing shape to complete the pattern.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">If the pattern continued what would the tenth shape be?</p> <p style="text-align: center;">Explain your reasoning.</p>
<p>use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).</p>	<p>Find as many ways as possible to show a number or calculation</p>











	<h2 style="text-align: center;">Turning Man</h2> <p style="text-align: center;">Age 5 to 7 ★</p> <p>Why do this problem?</p> <p><u>This problem</u> is intended to help children who are confident about turning themselves a quarter or half turn, but find it difficult to relate this to quarter or half turns in a picture or diagram. The <u>Turning Man</u> is a "halfway house" between these two.</p> <p>Possible approach</p> <p>Young children need plenty of opportunities to turn <i>themselves</i> before</p> <p style="text-align: center;">https://nrich.maths.org/5560/note</p> 								
Statistics									
interpret and construct simple pictograms, tally charts, block diagrams and simple tables	<p>Find as many ways as possible to show a number or calculation</p> <p>Four children played racing games at break time. Each time they won a game they took a counter.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td style="padding: 5px;">Sam</td> <td style="text-align: center; padding: 5px;">  </td> </tr> <tr> <td style="padding: 5px;">Tom</td> <td style="text-align: center; padding: 5px;">  </td> </tr> <tr> <td style="padding: 5px;">Sally</td> <td style="text-align: center; padding: 5px;">  </td> </tr> <tr> <td style="padding: 5px;">Ally</td> <td style="text-align: center; padding: 5px;">  </td> </tr> </tbody> </table> <p>Present the information in a different way to make it clearer and answer the following questions:</p> <p>Who won the most races?</p> <p>How many more races did Ally win than Sally?</p> <p>Does the information answer the question:</p> <p>Who is the fastest runner?</p>	Sam		Tom		Sally		Ally	
Sam									
Tom									
Sally									
Ally									
ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity	Use explaining>justifying>convincing>proving								





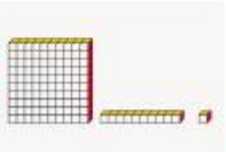
What's the same? What's different?



Ice creams sold in one week	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Cars in the car park on Monday at 10 o'clock	
Red	
Blue	
Black	
Silver	
White	
Other	



ask and answer questions about totalling and comparing categorical data.

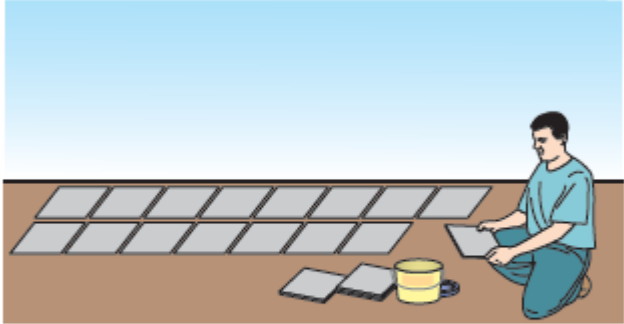
Expected	Year 3 Greater Depth						
<p>Place Value</p> <p>count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number</p>	<p>Explain what is the same or different about two numbers or calculations.</p> <div data-bbox="669 331 1447 740" style="border: 2px solid blue; padding: 10px;">  <p style="text-align: center;"><u>Greater Depth Challenge:</u></p> <p style="text-align: center;">Start on an even number and count in 4s. What are the next 5 numbers?</p> <p style="text-align: center;">Start on an odd number and count in 4s. What are the next 5 numbers?</p> <p style="text-align: center;">What do you notice about the numbers in each sequence? What rule can you create?</p> </div>						
<p>recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</p>	<p>Find as many ways as possible to show a number or calculation.</p> <p>What is the value of the number represented by the counters in the place value grid?</p> <table border="1" data-bbox="680 917 1417 1129"> <thead> <tr> <th data-bbox="680 917 936 976">100s</th> <th data-bbox="936 917 1178 976">10s</th> <th data-bbox="1178 917 1417 976">1s</th> </tr> </thead> <tbody> <tr> <td data-bbox="680 976 936 1129">  </td> <td data-bbox="936 976 1178 1129">  </td> <td data-bbox="1178 976 1417 1129">  </td> </tr> </tbody> </table> <p>Using all of the counters, how many different numbers can you make? Have you made all the possible numbers?</p> <p>Explain how you know.</p>	100s	10s	1s			
100s	10s	1s					
							
<p>compare and order numbers up to 1000</p>	<p>Use explaining>justifying>convincing>proving.</p>						


	 <p><u>Greater Depth Challenge:</u></p> $299 + 10 = \square - 10$ <p>What is the missing number? How do you know? Can you prove it?</p>	
<p>identify, represent and estimate numbers using different representations</p>	<p>Find as many ways as possible to show a number or calculation.</p>  <p><u>Greater Depth Challenge:</u></p> <p>Sarah says “601 is smaller than 579 because it has a zero in it.”</p> <p>Can you use each of these models to explain if she is correct or incorrect? You can use diagrams and drawings to help</p>   	<p>Find as many ways as possible to show a number or calculation.</p>
<p>read and write numbers up to 1000 in numerals and in words</p>	<p>Find as many ways as possible to show a number or calculation.</p>	

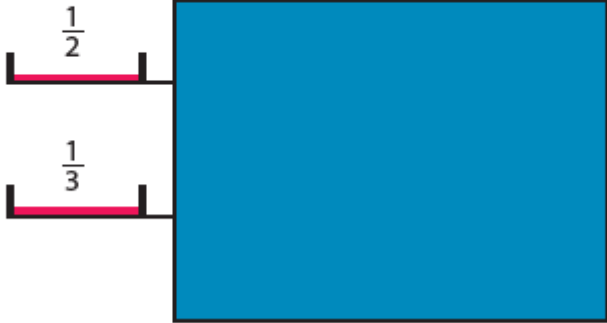

	<p>674 is made of 6 hundreds, 7 tens and 4 ones. 674 is also made of 67 tens and 4 ones. 674 is also made of 6 hundreds and 74 ones.</p> <p>Find different ways of expressing:</p> <ul style="list-style-type: none"> ■ 630 ■ 704 ■ 867
<p>solve number problems and practical problems involving these ideas.</p>	<p>Find all the possible numbers that satisfy criteria.</p> <p> Greater Depth Challenge:</p> <p>What numbers do you think each of these letters could represent? Explain your reasoning!</p> 
<p>Number – Addition and Subtraction</p>	
<p>add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> a three-digit number and ones a three-digit number and tens a three-digit number and hundreds 	<p>Find all the possible numbers that satisfy criteria.</p> <p>Sophie has five coins in her pocket. How much money might she have? What is the greatest amount she can have? What is the least amount she can have?</p> <p>If all the coins are different: What is the greatest amount she can have? What is the least amount she can have?</p>

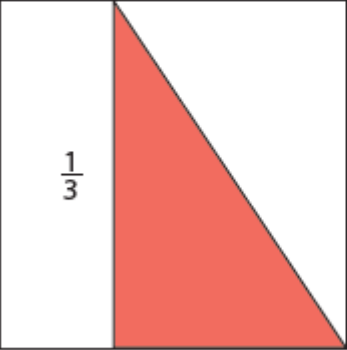
<p>add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</p>	<p>Be confident and independent when working.</p> <p>There are six 3-digit addition calculations shown below.</p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center; width: 33%;">a) $\begin{array}{r} 124 \\ + 233 \\ \hline \end{array}$</td> <td style="text-align: center; width: 33%;">b) $\begin{array}{r} 644 \\ + 172 \\ \hline \end{array}$</td> <td style="text-align: center; width: 33%;">c) $\begin{array}{r} 366 \\ + 277 \\ \hline \end{array}$</td> </tr> <tr> <td style="text-align: center; width: 33%;">d) $\begin{array}{r} 579 \\ + 221 \\ \hline \end{array}$</td> <td style="text-align: center; width: 33%;">e) $\begin{array}{r} 791 \\ + 163 \\ \hline \end{array}$</td> <td style="text-align: center; width: 33%;">f) $\begin{array}{r} 567 \\ + 233 \\ \hline \end{array}$</td> </tr> </table> <p>Which calculations have no carry digits? Which calculations have a carrying digit only once? Which calculations have a carrying digit twice? Which calculation has the largest answer? Which calculation has the smallest answer?</p> <p><i>Check that children are looking at the numbers involved, rather than doing the calculations.</i></p>	a) $\begin{array}{r} 124 \\ + 233 \\ \hline \end{array}$	b) $\begin{array}{r} 644 \\ + 172 \\ \hline \end{array}$	c) $\begin{array}{r} 366 \\ + 277 \\ \hline \end{array}$	d) $\begin{array}{r} 579 \\ + 221 \\ \hline \end{array}$	e) $\begin{array}{r} 791 \\ + 163 \\ \hline \end{array}$	f) $\begin{array}{r} 567 \\ + 233 \\ \hline \end{array}$
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d) $\begin{array}{r} 579 \\ + 221 \\ \hline \end{array}$	e) $\begin{array}{r} 791 \\ + 163 \\ \hline \end{array}$	f) $\begin{array}{r} 567 \\ + 233 \\ \hline \end{array}$					
<p>estimate the answer to a calculation and use inverse operations to check answers</p>	<p>Use explaining>justifying>convincing>proving.</p>						

	 <p><u>Greater Depth Challenge:</u></p> <p>Sam is adding multiples of 100. He writes his answers down</p> <p>Do you agree with his mental calculations? How would you explain the mistake to Sam?</p> <p>700 + 100 = 7100</p> <p>800 + 100 = 8100</p> <p>900 + 100 = 9100</p>	
<p>solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</p>	<p>Explain why a statement is correct or wrong.</p>  <p><u>Greater Depth Challenge:</u></p> <p>Sometimes, always or never?</p> <p>Katie says:</p> <p><i>“When you add a one digit number to a three digit number, the only column that changes is the ones column. For example $395 + 3 = 398$”</i></p>	
<p>Number – Multiplication and Division recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</p>	<p>Explain what is the same or different about two numbers or calculations.</p>	

	<p>What is the relationship between these calculations?</p> <p>2×3 4×3 2×30 4×30 20×3 40×3 $20 \times 3 \times 10$ $40 \times 3 \times 10$</p> <p><i>Children should use their knowledge of place value to mentally calculate by multiples of 10.</i></p>
<p>write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods</p>	<p>Be confident and independent when working.</p> <p>Make up a problem for 13×4 and solve it.</p> <p>Write a story for $18 \div 3$.</p>
<p>solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.</p>	<p>Find all the possible numbers that satisfy criteria.</p> <div style="display: flex; align-items: flex-start;">  <div style="margin-left: 20px;"> <p>Roger has 96 patio slabs. Using all of the slabs find three different ways that he can arrange the slabs to form a rectangular patio.</p> </div> </div>

	$\square \square \times \square = ?$ Putting the digits 1, 2 and 3 in the empty boxes, how many different calculations can you make? Which one gives the largest answer? Which one gives the smallest answer?
Number - Fractions	
<p>count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10</p>	<p>Find as many ways as possible to show a number or calculation.</p> <p>This is 0.4 or $\frac{2}{5}$ of a bag of marbles. How many marbles are in a full bag?</p> 
<p>recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</p>	<p>Use explaining>justifying>convincing>proving</p>

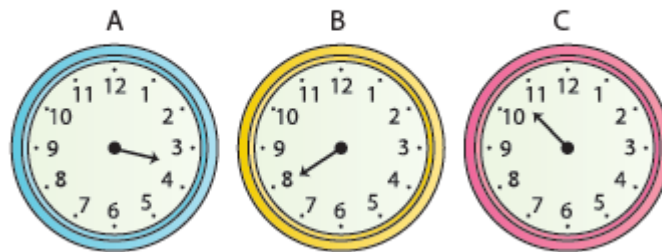
	<p>Only a fraction of each line is shown. The rest is hidden behind the blue screen. Which whole line is the longer?</p> <p>Explain your reasoning.</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">First:</div>  </div> <div style="margin-top: 10px;"> <div style="margin-right: 10px;">Second:</div>  </div>
<p>recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</p>	<p>Explain what is the same or different about two numbers or calculations.</p> <p>On a number line labelled 0 to 1, mark $\frac{1}{6}$, $\frac{1}{3}$ and $\frac{1}{2}$.</p> <p>How big is the interval from $\frac{1}{6}$ to $\frac{1}{3}$?</p> <p>How big is the interval from $\frac{1}{6}$ to $\frac{1}{2}$?</p>
<p>recognise and show, using diagrams, equivalent fractions with small denominators</p>	<p>Use explaining>justifying>convincing>proving</p>

	<p>What fraction of the square is shaded?</p> <p>Explain your reasoning.</p> 
<p>add and subtract fractions with the same denominator within one whole [for example, $5/7 + 1/7 = 6/7$]</p>	<p>Find all the possible numbers that satisfy criteria.</p> <p>Fill in the numerators to make the calculation correct.</p> <p>How many ways can you do it?</p> <p>Explain how you know you have found them all.</p> $\frac{\quad}{8} + \frac{\quad}{8} = 1$
<p>compare and order unit fractions, and fractions with the same denominators</p>	
<p>solve problems that involve all of the above.</p>	<p>Find as many ways as possible to show a number or calculation.</p> <p>Jo ate $\frac{1}{4}$ of a pizza and Sam ate $\frac{1}{2}$ of what was left. Mike ate the rest of the pizza.</p> <p>Draw a diagram to show how much pizza Jo, Sam and Mike each ate.</p>

Measurement	
<p>measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</p>	<p>Find as many ways as possible to show a number or calculation.</p> <p>A crocodile is 3 times as long as a pig. An elephant is 1.2 m longer than the crocodile. The elephant is 4.2 m long. How long is the pig?</p>
<p>measure the perimeter of simple 2-D shapes</p>	<p>Find all the possible numbers that satisfy criteria.</p> <p>Draw as many rectangles as you can with a perimeter of 24cm.</p> <p>Explain how you know you have drawn them all.</p>
<p>Add and subtract amounts of money to give change, using both £ and p in practical contexts</p>	<p>Find as many ways as possible to show a number or calculation.</p> <p>Sophie and Ravi have saved some money. Altogether they have saved £35. Sophie has saved £4 more than Ravi. How much have they each saved?</p> <p>Sam and Tom share this money equally. Divide the coins into two equal groups. Could three friends share the money equally?</p> <p>Explain your reasoning.</p> <div data-bbox="1249 868 1738 1294" data-label="Image"> <p>The image shows a collection of seven British coins. There are three 20p coins (two octagons and one circle), one 50p coin (an octagon), one 10p coin (a circle), and two 5p coins (circles).</p> </div>
tell and write the time from an analogue	Use explaining>justifying>convincing>proving.

clock, including using Roman numerals from 1 to XII, and 12-hour and 24-hour clocks

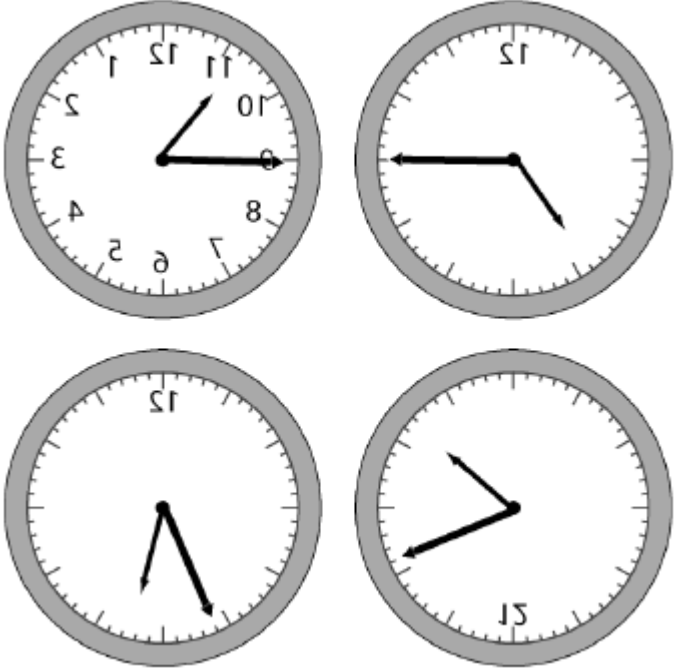
These clocks have only one hand, but can you suggest a time that each could be showing?






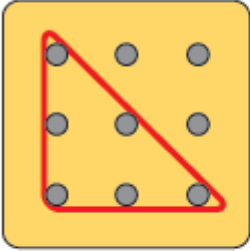
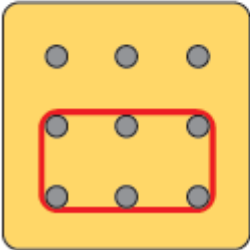
Explain your reasoning.


Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight

Find all the possible numbers that satisfy criteria.

	 <p>These clocks have been reflected in a mirror. What times do they say? https://nrich.maths.org/1812/note</p>
<p>know the number of seconds in a minute and the number of days in each month, year and leap year</p>	
<p>compare durations of events [for example to calculate the time taken by particular events or tasks].</p>	<p>Find as many ways as possible to show a number or calculation.</p> <p>Sam takes 40 seconds to tie his laces. Tom takes twice as long. Bob takes $\frac{3}{4}$ of this time. How many minutes for all of them to tie their laces?</p>
<p>Geometry – Property of shapes and Position and direction</p>	
<p>draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and</p>	<p>Use explaining>justifying>convincing>proving</p>

<p>describe them</p>	<p>True or false? The shape of a cross section of a sphere is always a circle. The shape of a cross section of a cylinder is always a circle. The shape of a cross section of a cone is always a circle.</p> <p>Explain your reasoning.</p> <p>Can you identify a 3-D shape where the cross section is always a square?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>sphere</p> </div> <div style="text-align: center;">  <p>cylinder</p> </div> <div style="text-align: center;">  <p>cone</p> </div> </div>
<p>recognise angles as a property of shape or a description of a turn</p>	<p>Find as many ways as possible to show a number or calculation</p>

	<p>How many different triangles can you find on a 3×3 pin geoboard? How do you decide that they are different?</p>  <p>How many different quadrilaterals can you find on a 3×3 pin geoboard? How do you decide that they are different?</p> 
<p>identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle</p>	<p>Be confident and independent when working.</p> <p>Estimating Angles nRich https://nrich.maths.org/1235</p>

<p>identify horizontal and vertical lines and pairs of perpendicular and parallel lines.</p>	<p>Be confident and independent when working.</p> <p>In this problem we are looking at sets of parallel sticks that cross each other.</p>  <p>There are four red sticks which make four crossings. How many crossings do the five green sticks make?</p> <p>https://nrich.maths.org/2792</p>
<p>Statistics</p>	
<p>interpret and present data using bar charts, pictograms and tables</p>	<p>Use explaining>justifying>convincing>proving.</p> <p>Using the bar chart, prove that twice as many children like football than hockey'</p>
<p>Solve one step and two step questions, (e.g. 'How many more?' & "How many fewer?') using information presented in scaled bar charts and pictograms and tables.</p>	<p>Explain why a statement is correct or wrong</p>



Here are the lists of first names of the members of Class 5. (They are in alphabetical order of their surnames so they do not seem to be ordered.)


Girls in Class 5	Boys in Class 5
Hetty	David
Annie	Nelson
Tessa	Ali
Debbie	Jake
Willow	Harry P
Jess	William
Abby	Ben
Sindy	Tom
Penny	Dai
Bel	Arlo
Sara	Andrew
Pippa	Harry W
Selma	Tim
Becky	Joe
Mel	Alan
Pauline	James
Netty	Jeff
	Mohammed

One day when **34** children were in class, Mrs Clifton, their teacher, said they were going to make some block graphs and other things using their first names. She put the class lists onto the white board.

<https://nrich.maths.org/7522>

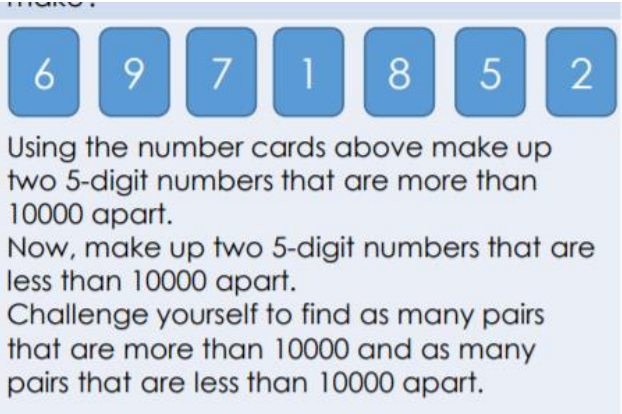
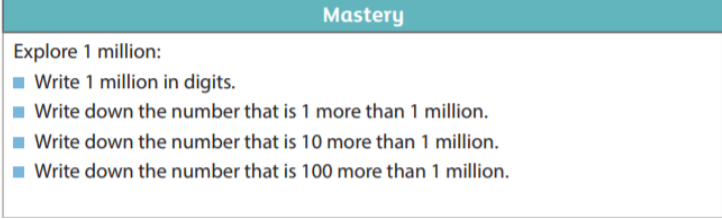
Code	Programme of Study- Expected	Year 4 Greater Depth
NI	count in multiples of 6, 7, 9, 25 and 1000	<p>Count in multiples of 6, 7, 9, 25 and 1000 from any number</p> <p>Greater depth means children explaining and reasoning, enabling them to deepen their mathematical understanding. e.g.</p> <ul style="list-style-type: none"> ➤ Convince me that the number 18 will be in this sequence: 54, 48, 42, 36... ➤ Here is a sequence of numbers. 6, 12, 18, 24 <p>What will be the 25th number in the sequence? What will the 50th number in the sequence be? How do you know? Explain your answer.</p> <ul style="list-style-type: none"> ➤ In Brighton the average June temperature at midday was 21 C. The average temperature drops by 7 C every two months. Which month did the temperature reach freezing point? ➤ Sam is training for an event. He runs 9 miles each week. He has 12 weeks until the event takes place. He only misses 1 week of training due to illness. He calculates that will have ran a total of 63 miles because 9 miles X 7 (days in a week) = 63. Is he correct? Explain your reasoning. <p>See Year 4- GD Number and Place Value Document and Year 4 Focus Maths document p.17</p>
N2a	order and compare numbers beyond 1000	<p>Order and compare numbers beyond 1000 and explain</p> <p>Order a set of whole numbers in ascending / descending order recognising the most significant digit in this process, e.g., 2500, 900, 750, 5300, 2501.</p> <p>Compare numbers and quantities by using = < and > symbols, e.g., < 3445 5089; placing numbers accurately on an un-numbered number line where only the start and end numbers are known.</p> <p>Describe the positional relationship between two numbers, e.g., 6721 is larger than 7000 but smaller than 8000.</p> <p>Greater depth means children explaining and reasoning, enabling them to deepen their mathematical understanding.</p>


		<p>How many four digit numbers can you make using the digit cards below?</p> <div style="text-align: center;">  </div> <p>Place them in ascending order.</p> <p>If Jamie wrote these numbers in ascending order, which number would be 5th?</p> <p style="text-align: center;">2122 2212 2112 2112 2102 2121</p>
N2b	find 1000 more or less than a given number	<p>Find 1000 more or less than a given number. Count orally from a given number increasing or decreasing by 1,000 and explain the digit patterns including the impact of crossing boundaries when moving between 1,000s and 10,000s.</p> <p>Greater depth means children explaining and reasoning, enabling them to deepen their mathematical understanding. e.g.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">What is the missing number?</p> <p>➤ Mia thinks of a number.</p>

		<p>She says: "The number 1000 less than my number uses the digit cards 3, 4, 5 and 6. The tens column is the only even digit in my number." What could her number be? How many possibilities can you find?</p>
<p>N3a</p>	<p>recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)</p>	<p>Understand zero as a place-holder in numbers, such as 2036, 4305, and 6007. Know the value of a chosen digit in a given number, e.g., in 1275 the 2 has a value of 200 Understand zero as a place-holder in numbers, such as 2036, 4305, and 6007. Greater depth means children explaining and reasoning, enabling them to deepen their mathematical understanding.</p> <p style="text-align: center;">These place value counters have no value. Can you use them to represent the following numbers?</p> <div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;"> <p>2743</p> <p>6286</p> <p>5091</p> </div> </div> <p style="text-align: center;">Explain what each counter represents and how you have made each number.</p> <p>Sophie picks these cards.</p> <div style="display: flex; justify-content: center; gap: 20px; margin: 10px 0;"> <div style="border: 1px solid blue; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">8</div> <div style="border: 1px solid blue; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">4</div> <div style="border: 1px solid blue; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">6</div> <div style="border: 1px solid blue; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">1</div> </div> <p>What is the 2nd smallest number she can make using these digit cards?</p> <p>↳ ~</p>

<p>N3b</p>	<p>read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value</p>	<p>Greater depth means children explaining and reasoning, enabling them to deepen their mathematical understanding.</p> <p>See Focus Maths p.81</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="background-color: #e1f5fe; padding: 10px; border: 1px solid #ccc; width: 45%;"> <p>The sum of two Roman Numbers is LXXV.</p> <p>One of the two Roman Numbers is 10 greater than the other. Write out the two numbers in Roman numerals.</p> <p>The product of two Roman numbers is XXIV.</p> <p>One of the two numbers is 11 less than V. What are the two numbers?</p> </div> <div style="background-color: #e1f5fe; padding: 10px; border: 1px solid #ccc; width: 45%;"> <p>Add and subtract the following Roman Numerals and give answers as both Roman and TU numbers.</p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center; padding: 5px;">$XXV + XXII$</td> <td style="text-align: center; padding: 5px;">$LX - XXIV$</td> </tr> <tr> <td style="text-align: center; padding: 5px;">$LX + XXVI$</td> <td style="text-align: center; padding: 5px;">$C - LXXII$</td> </tr> <tr> <td style="text-align: center; padding: 5px;">$XXVII + XXXVIII$</td> <td style="text-align: center; padding: 5px;">$LXX - VIII$</td> </tr> </table> </div> </div>	$XXV + XXII$	$LX - XXIV$	$LX + XXVI$	$C - LXXII$	$XXVII + XXXVIII$	$LXX - VIII$
$XXV + XXII$	$LX - XXIV$							
$LX + XXVI$	$C - LXXII$							
$XXVII + XXXVIII$	$LXX - VIII$							
<p>N4a</p>	<p>identify, represent and estimate numbers using different representations</p>							
<p>N4b</p>	<p>round any number to the nearest 10, 100 or 1000</p>	<p>Greater depth means children explaining and reasoning, enabling them to deepen their mathematical understanding. E.g.</p> <ul style="list-style-type: none"> ➤ The head teacher of a school wants to send Christmas cards to all 467 children in her school. Cards come in boxes of 10. How many boxes does she need to buy? Explain your reasoning. ➤ A number rounded to the nearest 10 is 650. What is the smallest possible number that it could be? Explain your reasoning. ➤ Always, sometimes, never? Jack rolls two six-sided die to create two 2-digit numbers. He rounds both of the numbers to the nearest 10. Do both of his numbers ever round to the same multiple of ten? Explain your answer. <p>See Year 4 GD Number and Place Value document</p>						

N5	count backwards through zero to include negative numbers	<p>Count backwards though zero to include negative numbers <i>and forwards from -10 through 0</i></p> <p>Greater depth means children explaining and reasoning, enabling them to deepen their mathematical understanding</p> <ul style="list-style-type: none"> ➤ Joe has £18 in his bank. He goes shopping and buys himself some shoes that cost £15, a t-shirt that costs £9 and a tie that costs £4. What is his new bank balance? Is there more than one way to solve this? Which way is more efficient? Why? ➤ Louise starts counting backwards from 8 in ones. What will be the 16th number she lands on? Explain how you know. <p>See Year 4 Focus Math's document p.11.</p>
N6	solve number and practical problems that involve all of the above and with increasingly large positive numbers	

Expected	Year 5 Greater Depth
<p>N1 – count forwards or backwards in steps of powers of 10 for any given number up to 1 00 000</p>	<p>ask their own mathematical questions and follow their own lines of enquiry when exploring an open-ended maths problem.</p>  <p>Using the number cards above make up two 5-digit numbers that are more than 10000 apart. Now, make up two 5-digit numbers that are less than 10000 apart. Challenge yourself to find as many pairs that are more than 10000 and as many pairs that are less than 10000 apart.</p>
<p>N2- read, write, order and compare numbers to at least 1 000 000</p>	<p>access maths problems presented in a wide range of different, complex ways Find all the possible numbers that satisfy criteria</p>  <p>Mastery</p> <p>Explore 1 million:</p> <ul style="list-style-type: none"> ■ Write 1 million in digits. ■ Write down the number that is 1 more than 1 million. ■ Write down the number that is 10 more than 1 million. ■ Write down the number that is 100 more than 1 million.
<p>N3a- determine the value of each digit in numbers to 1 000 000</p>	<p>be able to justify and prove their conjectures when reasoning;</p> <ul style="list-style-type: none"> ● Explain why a statement is correct or wrong.

	<p style="text-align: center;">Mastery with Greater Depth</p> <p>Using all of the digits from 0 to 9, write down a 10-digit number.</p> <p>What is the largest number you can write? What is the smallest number you can write?</p> <p>Write down the number that is one less than the largest number. Write down the number that is one more than the smallest number.</p> <p>Captain Conjecture says, 'Using the digits 0 to 9 we can write any number, no matter how large or small.'</p> <p>Do you agree? Explain your reasoning.</p> 															
<p>N3b- read Roman numerals to 1000 and recognise years written in Roman numerals</p>	<table border="1" data-bbox="448 801 1008 1153"> <thead> <tr> <th>Date</th> <th>Roman Date</th> </tr> </thead> <tbody> <tr> <td>4/11/2011</td> <td>IV/ XI/ MMXI</td> </tr> <tr> <td>19/12/1990</td> <td></td> </tr> <tr> <td>12/4/1951</td> <td></td> </tr> <tr> <td>30/7/2007</td> <td></td> </tr> <tr> <td>18/5/2011</td> <td></td> </tr> <tr> <td>7/5/1980</td> <td></td> </tr> </tbody> </table> <p>access maths problems presented in a wide range of different, complex ways</p>	Date	Roman Date	4/11/2011	IV/ XI/ MMXI	19/12/1990		12/4/1951		30/7/2007		18/5/2011		7/5/1980		
Date	Roman Date															
4/11/2011	IV/ XI/ MMXI															
19/12/1990																
12/4/1951																
30/7/2007																
18/5/2011																
7/5/1980																
<p>N4- round any number to 1 000 000 to the</p>	<p>access maths problems presented in a wide range of different, complex ways</p>															

<p>nearest 10, 100, 1000, 10 000 and 100 000</p>	<p>In June 2014 the population of the UK was approximately 64 100 000.</p> <p>Round this number to the nearest million.</p>																
<p>N5- interpret negative numbers in context</p>	<p>be able to justify and prove their conjectures when reasoning;</p> <ul style="list-style-type: none"> Use explaining>justifying>convincing>proving <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The temperature at 6 a.m. was recorded each day for one week.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Day</th> <th>Mon</th> <th>Tues</th> <th>Wed</th> <th>Thurs</th> <th>Fri</th> <th>Sat</th> <th>Sun</th> </tr> </thead> <tbody> <tr> <td>Temp (°C)</td> <td>1</td> <td>-1</td> <td>0</td> <td>3</td> <td>2</td> <td>-2</td> <td>-3</td> </tr> </tbody> </table> <p>What is the difference in temperature between the coldest day and the warmest day?</p> <p>At what time of year do you think these temperatures were recorded?</p> <p>Do you think it might have snowed during the week?</p> <p>Explain your reasoning.</p> </div>	Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Temp (°C)	1	-1	0	3	2	-2	-3
Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun										
Temp (°C)	1	-1	0	3	2	-2	-3										

Which of these sequences are correct and which are not? Explain why.

-19	-14	-9	-4	0	+4	+9
-----	-----	----	----	---	----	----

17	13	9	5	1	-3	-7
----	----	---	---	---	----	----

18	8	0	-2	-12	-22	-32
----	---	---	----	-----	-----	-----

125	90	55	30	-5	-40	-75
-----	----	----	----	----	-----	-----

Decide on your own positive or negative number to operate these machines

In	Out	In	Out
+2		-56	
-13		-34	
-6		+2	
-28		-54	
+21		-6	

be able to justify and prove their conjectures when reasoning;

- Use explaining>justifying>convincing>proving
- Asking their own mathematical questions and following their own lines of enquiry

N6- solve number problems and practical problems that

- Use explaining>justifying>convincing>proving

involve all of the above													
C1- add and subtract numbers mentally with increasingly larger numbers	<p>access maths problems presented in a wide range of different, complex ways</p> <div data-bbox="443 368 1104 858" style="border: 1px solid #ccc; background-color: #e6f2ff; padding: 10px;"> <p>Minus 1500 Take 1,500 away from each of these numbers: Mentally first and then check</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">1,234,893</td> <td style="padding: 5px;">439,265</td> <td style="padding: 5px;">812,256</td> </tr> <tr> <td style="padding: 5px;">768,092</td> <td style="padding: 5px;">845,289</td> <td style="padding: 5px;">723,127</td> </tr> </table> <p>Take 50,000 away from each of these numbers:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">1,346, 989</td> <td style="padding: 5px;">2,346, 235</td> <td style="padding: 5px;">3,125,890</td> </tr> <tr> <td style="padding: 5px;">2,562,123</td> <td style="padding: 5px;">5,763,124</td> <td style="padding: 5px;">7.090,123</td> </tr> </table> </div>	1,234,893	439,265	812,256	768,092	845,289	723,127	1,346, 989	2,346, 235	3,125,890	2,562,123	5,763,124	7.090,123
1,234,893	439,265	812,256											
768,092	845,289	723,127											
1,346, 989	2,346, 235	3,125,890											
2,562,123	5,763,124	7.090,123											
C2- add and subtract whole numbers with more than 4 digits including using the formal written method	<p>access maths problems presented in a wide range of different, complex ways</p> <ul style="list-style-type: none"> • Explain what is the same or different about two numbers or calculations. 												

Mastery

Set out and solve these calculations using a column method.

$$3254 + \square = 7999$$

$$2431 = \square - 3456$$

$$6373 - \square = 3581$$

$$6719 = \square - 4562$$

$$\square + 14675 = 6\square724$$

Which numbers go in the boxes?
What different answers are there?

Now try:


$$\square4326 + 32\square72 = \square$$

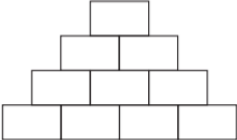
Set each calculation out as columnar addition

C3- use rounding to check answers to calculations

access maths problems presented in a wide range of different, complex ways

	<p>Two 3-digit numbers have been rounded to the nearest 10 and then added together or subtracted. Here are some of the answers.</p> <p>230; 560; 780; 920; 830</p> <p>Work out what possible calculations they could have been in the first place (both additions and subtractions).</p> <p>Now do the same by creating two 4-digit numbers that have been rounded to the nearest 1000.</p> <table border="1" data-bbox="454 496 770 568"> <thead> <tr> <th>Stage 1</th> <th>Stage 2</th> <th>Stage 3</th> <th>Stage 4</th> <th>Stage 5</th> </tr> </thead> <tbody> <tr> <td>2415Km</td> <td>1724Km</td> <td>821Km</td> <td>938Km</td> <td>2109Km</td> </tr> </tbody> </table> <p>They are trying to work how much they will spend on fuel. Firstly, they round up each stage to the nearest 100Km. and then they work out that each 100Km will cost them £15 in fuel. What will be the approximate cost of the fuel?</p> <p>Look at the table below showing costs of train tickets between London and</p> <table border="1" data-bbox="786 240 1099 320"> <thead> <tr> <th></th> <th>Milton K</th> <th>Stoke</th> <th>M'chest</th> </tr> </thead> <tbody> <tr> <td>Adult</td> <td>£67.85</td> <td>£82.92</td> <td>£121.95</td> </tr> <tr> <td>Child</td> <td>£35.50</td> <td>£45.50</td> <td>£75.55</td> </tr> </tbody> </table> <p>Round the amounts to the nearest £10 and answer these questions: I have £100, will I have enough to buy an adult and a child ticket to Milton Keynes? I have £200, will I have enough to buy 1 adult and 2 children's tickets to Stoke? Now make up some more questions of your own.</p> <p>A family is going on a driving holiday around America. They have 5 stages to the holiday. The distances travelled are outlined on the table.</p>	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	2415Km	1724Km	821Km	938Km	2109Km		Milton K	Stoke	M'chest	Adult	£67.85	£82.92	£121.95	Child	£35.50	£45.50	£75.55	
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Adult	£67.85	£82.92	£121.95																					
Child	£35.50	£45.50	£75.55																					
<p>C4- solve addition and subtraction multi-step problems</p>	<p>access maths problems presented in a wide range of different, complex ways</p> <div data-bbox="443 842 1115 1254" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #00a68f; color: white; padding: 5px;">Mastery with Greater Depth</p> <p>Sam and Tom have £67.80 between them. If Sam has £6.20 more than Tom, how much does Tom have? <i>The bar model can help children solve these type of problems, please visit ncetm.org for further information on how to build understanding.</i></p> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="margin-right: 10px;">Sam</div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background-color: #0070c0; margin-right: 5px;"></div> <div style="margin-right: 10px;">+ £6.20</div> </div> </div> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="margin-right: 10px;">Tom</div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background-color: #0070c0; margin-right: 5px;"></div> </div> </div> <div style="margin-left: 100px; margin-top: 10px;">} £67.80</div> <div style="margin-top: 20px;"> <p>£67.80 – £6.20 = £61.60 £61.60 ÷ 2 = £30.80 Tom has £30.80</p> </div> </div>																							

<p>C5a- Identify multiples and factors</p>	<p>be able to justify and prove their conjectures when reasoning;</p> <ul style="list-style-type: none"> Use explaining>justifying>convincing>proving <div data-bbox="443 389 1106 740" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #00A0C0; color: white; margin: 0;">Mastery with Greater Depth</p> <p>Captain Conjecture says, 'Factors come in pairs so all numbers have an even number of factors.'</p> <p>Do you agree? Explain your reasoning.</p>  </div>
<p>C5b- know and use the vocabulary of prime numbers and composite numbers</p>	<ul style="list-style-type: none"> Use explaining>justifying>convincing>proving <p>Explaining why numbers are prime and composite and how they know. Explaining why 1 is not a prime number.</p>
<p>C5c – establish whether a number up to 100 is prime and recall numbers to 19</p>	<p>access maths problems presented in a wide range of different, complex ways</p> <ul style="list-style-type: none"> Finding the most efficient way of finding a solution.

	<p>Starting from 1, name the 6th prime number when counting to 100.</p> <p>Starting from 5, name the 6th prime number when counting on towards 100.</p> <p>Starting at 90, name the 4th prime number when counting backwards from 90.</p> <p>Starting at 2, name the 10th composite number you will say when counting on towards 100.</p> <p>Starting at 90, name the 5th composite number you will say when counting back.</p> <p>Create a grid with numbers on the</p>
<p>C5d- recognise and use square and cube numbers</p>	
<p>C6a- multiply and divide mentally drawing upon known facts</p>	<p>be able to justify and prove their conjectures when reasoning;</p> <ul style="list-style-type: none"> • Use explaining>justifying>convincing>proving <div data-bbox="445 887 1111 1302" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #00a696; color: white; margin: -10px -10px 10px -10px;">Mastery with Greater Depth</p> <p>Put the numbers 1, 2, 3 and 4 in the bottom row of this multiplication pyramid in any order you like.</p> <p>What different numbers can you get on the top of the number pyramid? How can you make the largest number?</p> <p>Explain your reasoning.</p> <div style="text-align: center;">  </div> </div>

<p>C6b- multiply and divide numbers and those involving decimals by 10, 100 and 1000</p>	<p>access maths problems presented in a wide range of different, complex ways Finding the most efficient way of finding a solution</p> <div data-bbox="448 331 1003 746" style="background-color: #e6f2ff; padding: 10px;"> <p>At the school concert there were 200 seats. The tickets were all sold and the school collected £2,400 for them. Find a quick way of working out how much each ticket cost.</p> <p>The shopkeeper announced that he had just received a special delivery of the new Wonka chocolate bar. He sold all his 2000 bars within the hour. He added up the money he took for them and it came to £2400. Find a quick way of finding out how much each bar cost.</p> </div>						
<p>C7a- multiply numbers up to 4 digits by one or two digit numbers using the formal written method</p>	<p>access maths problems presented in a wide range of different, complex ways Find all the possible numbers that satisfy criteria</p> <div data-bbox="448 927 1034 1291" style="background-color: #e6f2ff; padding: 10px;"> <p>Find the missing digit:</p> <table style="width: 100%; text-align: center;"> <tr> <td>$\begin{array}{r} 2 \square 6 \\ 16X \\ \hline 3776 \end{array}$</td> <td>$\begin{array}{r} \square 25 \\ 18x \\ \hline 7650 \end{array}$</td> <td>$\begin{array}{r} 728 \\ 2 \square x \\ \hline 16016 \end{array}$</td> </tr> <tr> <td>$\begin{array}{r} 32 \square \\ 18x \\ \hline 5832 \end{array}$</td> <td>$\begin{array}{r} \square 25 \\ 24x \\ \hline 17400 \end{array}$</td> <td>$\begin{array}{r} 662 \\ 2 \square \\ \hline 17212 \end{array}$</td> </tr> </table> </div>	$\begin{array}{r} 2 \square 6 \\ 16X \\ \hline 3776 \end{array}$	$\begin{array}{r} \square 25 \\ 18x \\ \hline 7650 \end{array}$	$\begin{array}{r} 728 \\ 2 \square x \\ \hline 16016 \end{array}$	$\begin{array}{r} 32 \square \\ 18x \\ \hline 5832 \end{array}$	$\begin{array}{r} \square 25 \\ 24x \\ \hline 17400 \end{array}$	$\begin{array}{r} 662 \\ 2 \square \\ \hline 17212 \end{array}$
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<p>C7b- divide numbers up to 4 digits by one digit numbers using the formal written method</p>	<p>access maths problems presented in a wide range of different, complex ways Find all the possible numbers that satisfy criteria</p> <div style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <p>When 3472 was divided by a single-digit number between 3 and 9 there was no remainder. How many possible single-digit numbers could there have been?</p> <p>When 4673 was divided by a single digit number larger than 5 there was a remainder of 2. How many possible single-digit numbers could there have been?</p> </div>
<p>C8a- words problems using knowledge of factors, multiples, squares and cubes</p>	
<p>C8b- solve word problems that involve the equals sign</p>	<p>access maths problems presented in a wide range of different, complex ways</p> <div style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <p>Fill in the missing numbers: $\square \div 120 = 117 \div 13 = 10800 \div \square = 234 \div \square$</p> </div>
<p>C8c- solve word problems that include scaling by</p>	

<p>simple fractions and simple rates.</p>	
<p>F2a- recognise improper and mixed number fractions and convert between them</p>	<ul style="list-style-type: none"> Asking their own mathematical questions and following their own lines of enquiry <div style="background-color: #e6f2ff; padding: 10px; border: 1px solid #add8e6;"> <p>Convert the following sets of improper fractions to mixed fractions and then order them putting the highest value first:</p> <p> $\frac{12}{5}$ $\frac{7}{2}$ $\frac{8}{3}$ $\frac{19}{5}$ $\frac{22}{3}$ $\frac{17}{8}$ $\frac{21}{4}$ $\frac{30}{7}$ </p> <p> $\frac{15}{4}$ $\frac{19}{2}$ $\frac{33}{7}$ $\frac{14}{9}$ $\frac{7}{2}$ $\frac{9}{5}$ $\frac{17}{7}$ $\frac{23}{7}$ </p> <p>Use one of the following signs to complete these sentences (<; >; =)</p> <p> $3\frac{1}{8}$ <input type="text"/> $\frac{17}{8}$ </p> <p> $6\frac{3}{4}$ <input type="text"/> $\frac{29}{4}$ </p> <p> $8\frac{3}{8}$ <input type="text"/> $7\frac{5}{8}$ </p> <p>Now create 2 of your own for your friends to solve.</p> <p style="text-align: right; font-size: small;">(c) Focus Education (UK) Ltd</p> </div>
<p>F2b- identify, name and write equivalent fractions</p>	
<p>F3- compare and order fractions</p>	<p>access maths problems presented in a wide range of different, complex ways</p>

Mastery

Make each number sentence correct using =, > or <.

$$\frac{3}{4} \bigcirc \frac{1}{2}$$
$$\frac{3}{8} \bigcirc \frac{1}{2}$$
$$\frac{3}{4} \bigcirc \frac{3}{8}$$

$$1\frac{3}{4} \bigcirc 2\frac{1}{2}$$
$$\frac{3}{2} \bigcirc 1\frac{1}{2}$$
$$3\frac{3}{4} \bigcirc 3\frac{3}{8}$$

$$\frac{2}{4} \bigcirc \frac{1}{2}$$
$$\frac{2}{5} \bigcirc \frac{4}{10}$$
$$\frac{2}{5} \bigcirc \frac{5}{10}$$

Put the following in order with the lowest value first:

1. $\frac{1}{2}$ 0.3 $\frac{6}{10}$ 0.4 $\frac{3}{4}$

2. $\frac{1}{8}$ 0.2 $\frac{1}{4}$ $\frac{3}{4}$ 0.9

3. $\frac{1}{3}$ 0.4 $\frac{2}{3}$ 0.7 0.9

Use one of the following signs (> ; < ; or =) to complete the following:

0.3 $\frac{3}{4}$

$\frac{1}{2}$ 0.6

$\frac{7}{8}$ 0.8

F4- add and subtract fractions

access maths problems presented in a wide range of different, complex ways

- Find as many ways as possible to show a number or calculation.

Using the numbers 3, 4, 5 and 6 only once, make this sum have the smallest possible answer:

$$\frac{\square}{\square} + \frac{\square}{\square} =$$

F5- multiply proper and mixed number fractions by whole numbers	
F6a- read and write decimals as fractions	
F6b- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	
F7- round decimals with two decimal places to the nearest whole number and to one decimal number.	<ul style="list-style-type: none"> • Finding the most efficient way of finding a solution.

Complete this table:

Number	Nearest whole	Nearest Tenth	Nearest hundredth
3.126			
4.652			
5.912			
18.459			
17.992			
91.225			
11.002			

F8- read, write and order and compare numbers with up to 3 decimal places

- Find as many ways as possible to show a number or calculation.
- Asking their own mathematical questions and following their own lines of enquiry

Look at these 8 cards:



Using as many or as few as you need how many numbers with three decimal places can you make up that are between 7.001 and 7.105?

	<p>What's in a number:</p> <p>Take a number like 23.763</p> <p>It is <input type="text"/> less than 24</p> <p>It is <input type="text"/> more than 23</p> <p>It is <input type="text"/> more than 23.5</p> <p>It is <input type="text"/> less than 23.8</p> <p>Now find another number with 3 decimal places and ask your friends similar questions.</p>
<p>F10- solve problems involving numbers up to 3 decimal places</p>	
<p>F11- recognise the per cent symbol</p>	<p>be able to justify and prove their conjectures when reasoning;</p> <ul style="list-style-type: none"> • Use explaining>justifying>convincing>proving

Order!! Order!!

Put these sets of numbers in the correct order, starting with the largest.

7/10 0.73 7/100 0.073 71%


9/10 0.91 9/100 0.093 92%

Explain your thinking.

F12- solve problems which require knowing percentage and decimal equivalents of 1/2 etc

M4- solve problems involving converting between units of time

access maths problems presented in a wide range of different, complex ways



BUS TIMETABLE

Newport	06:50		07:25	08:45	09:10	09:45
Underwood	07:00	07:25	07:41	08:55	09:19	09:53
Magor	07:11	07:41	07:51	09:04	09:31	10:02
Rogiet	07:18	07:59	07:59	09:11	09:38	10:11
Caldicot	07:29	08:12	08:09	09:16	09:47	10:16
Partskewett	07:33	08:15	08:14	09:20	09:53	10:21
Chepstow	07:45	08:30	08:30		10:05	10:40

Look at the bus timetable:
 How many minutes does the first bus take between Newport and Chepstow?
 Look at the time the buses leave Underwood. What is the greatest and smallest gap in minutes?
 In minutes, what is the time difference between the first bus that leaves Newport and the last bus that leaves Newport?
 Take 7 clock faces and show the time for the 7.25 bus that leaves Newport and then for each of the stops for that bus.

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<p>M5- convert between different units of metric measure</p>	<ul style="list-style-type: none"> Use explaining>justifying>convincing>proving <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center; background-color: #00a69a; color: white; padding: 2px;">Mastery with Greater Depth</p> <p>True or false? $1.5 \text{ kg} + 600 \text{ g} = 2.1 \text{ kg} + 300 \text{ g}$ $32 \text{ cm} + 1.05 \text{ m} = 150 \text{ cm} - 0.13 \text{ m}$ $\frac{3}{4} \text{ l} + 0.05 \text{ l} = \text{half of } 1.6 \text{ l}$</p> <p>Explain your reasoning.</p> </div>
<p>M6- understand and use approximate equivalences</p>	<p>access maths problems presented in a wide range of different, complex ways</p> <ul style="list-style-type: none"> Finding the most efficient way of finding a solution. <div style="border: 1px solid black; padding: 5px; margin: 10px 0; background-color: #e6f2ff;"> <p>Baby Grow</p> <p>A newly born baby puts on one pound of weight each month. She was seven pounds exactly when she was born in April.</p> <ul style="list-style-type: none"> In grams, how much does she weigh in December? In grams, how much does she weigh the following April? In grams, how much will she weigh when she is two? </div>
<p>M7a- measure and calculate the</p>	<p>be able to justify and prove their conjectures when reasoning;</p>

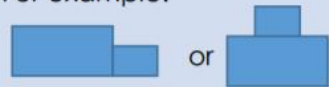
perimeter of composite rectilinear shapes

- Use explaining>justifying>convincing>proving

Put these two shapes together to create different shapes:



For example:



Will their perimeter and area always be the same? Explain your reasoning.

M7b- calculate the area of rectangles

If pupils have mastered this objective they will be able to complete these activities independently:



Use centimetre squared paper to create the following rectangles:

6 x 4 cm

10 x 4 cm

8 x 5 cm

Now for each of the above create another shape which has the same area and separately a shape which has the same perimeter.

Will the shape for area always be the same as the shape for perimeter?
Explain your thinking.

Using centimetre squared paper.


Make up 4 shapes that have 16 sq. cm
The shapes should not just be rectangles or squares.

Work out the perimeter of each of the shapes you have made and put a fence around the perimeter of each.

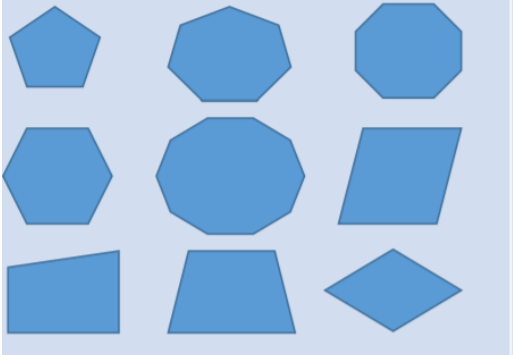
The fence costs £10 per metre.

Which is the most and least expensive to surround with fencing?

Draw a 4 x 4 square on this squared paper and then draw 2 more rectangles with the same area. Now find the perimeter of the 4x4 square and draw 2 other shapes with the same perimeter.

	<p>be able to justify and prove their conjectures when reasoning;</p> <ul style="list-style-type: none"> • Use explaining>justifying>convincing>proving
<p>M8- estimate volume</p>	
<p>M9a- solve problems involving measure</p>	<ul style="list-style-type: none"> • Finding the most efficient way of finding a solution. <div data-bbox="443 504 1104 1126" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #00a69a; color: white; margin: 0;">Mastery with Greater Depth</p> <p>A football weighs 0.4 kg. Three footballs weigh the same as eight cricket balls. How many grams does a cricket ball weigh?</p> <hr/> <p>A 1.2 m ribbon and a 90 cm ribbon are joined by overlapping the ends and gluing them together. The total length of ribbon needs to be 195 cm long. How much should the two pieces overlap?</p>  </div>
<p>G2a- use properties of rectangles to deduce related facts</p>	<ul style="list-style-type: none"> • Finding the most efficient way of finding a solution.

	<p>Knowing what you know about rectangles, work out the following sides.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <p>My perimeter is 34cm Two of my sides measure 5cm What do my other 2 sides measure?</p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <p>My area is 50cm². My perimeter is 30cm. What do my sides measure?</p> </div> <div style="border: 1px solid #ccc; padding: 5px;"> <p>My area is 48cm². Two of my sides measure 6cm. What do my other 2 sides measure?</p> </div>
<p>G2b- distinguish between regular and irregular polygons</p>	<ul style="list-style-type: none"> • Asking their own mathematical questions and following their own lines of enquiry

	<p>Name each of these shapes:</p>  <p>Same and Different Take any two of the shapes above and explain how they differ from one another. Record your findings.</p> <p>You could choose two and give them to your friend to explain and then record.</p> <p>Name a shape that has more than 4 sides and has a least one set of parallel lines.</p>
<p>G3b- identify 3D shapes from 2D representations</p>	<ul style="list-style-type: none"> • Asking their own mathematical questions and following their own lines of enquiry

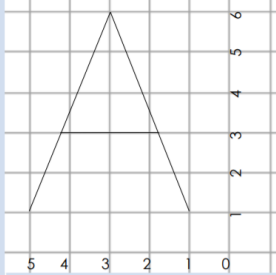
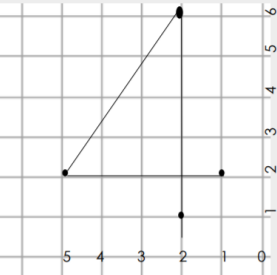
Mastery	Mastery with Greater Depth
<p>What shapes do you make when these 2-D representations (nets) are cut out and folded up to make 3-D shapes?</p> <p>A</p> <p>B</p>	<p>Draw the 2-D representation (net) that will make this cuboid when cut out and folded up.</p>

activities independently:

Look carefully at each of these two nets. Although they look similar they make different 3D shapes. Firstly, make up the two shapes shown following the dimensions as set out. Name them, in relation to 3D shapes.

G4a- know angles are measured in degrees

G4b- identify angles around a point, straight line

<p>G4c- draw angles and measure them</p>	<p>Draw the capital letter 'A' where the angle at the top is 30°.</p> <p>Draw the capital letter 'K', ensuring that the angle in the centre is 45°.</p> <p>Draw the capital letter 'V' ensuring that the angle at the bottom is 35°.</p> <p>Draw the capital letter 'X' making sure that the intersecting angles are 45°.</p>	
<p>P2- identify, represent and describe the position of a shape after reflection and translation</p>	<ul style="list-style-type: none"> Asking their own mathematical questions and following their own lines of enquiry <div data-bbox="443 660 1122 1150" style="border: 1px solid black; padding: 5px;"> <p>Activities for pupils working at greater depth:</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;">  <p>Starting with the letter A, plot letters of the alphabet on to the first or second quadrant and then reflect them into the other quadrants taking account of the distance from the vertical and horizontal axes. Use only letters that have straight lines: A E F H I K L M N T V W X Y Z</p> </div> <div style="width: 45%;">  <p>Using the numbers 4 and 7 plot each onto the first or second quadrant as shown with the number 4 above – record the points and then translate the number into another quadrant taking careful note of the movements made. Now choose 4 letters from the alphabet to do the same with.</p> </div> </div> </div>	
<p>S1- complete, read and interpret information in tables</p>	<ul style="list-style-type: none"> Asking their own mathematical questions and following their own lines of enquiry 	

DEPARTURES

Time	Flight	Destination	Gate
12:00	OD 1961	New York	06
12:15	PN 0034	Chicago	18
12:20	T3 0529	Las Vegas	32
12:30	PN 2415	Honolulu	14
12:50	GI 1872	San Francisco	09
12:55	T3 0944	Washington	27
13:20	SF 2778	Houston	20
13:45	OD 0061	Miami	31
13:50	BK 1532	Boston	04
14:05	OD 3487	New York	12
14:30	PN 0194	Atlanta	03
14:35	SF 0028	Chicago	08

Departure time

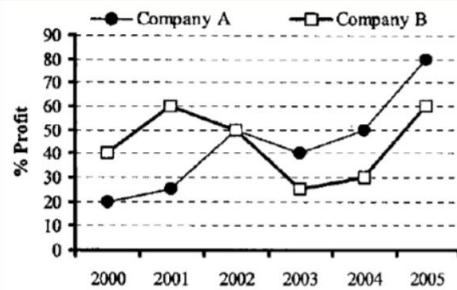
This Departure timetable tells you the times flights leave for various American cities. It gives you the time of departure; flight number; destination and which gate it leaves from. Use the information to create 10 questions you could ask your friends related to this timetable. Now create a similar departure board for planes leaving Heathrow.

A train leaves London Victoria every 30

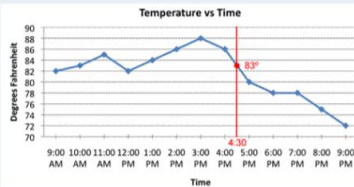
S2- solve problems using line graphs

- Asking their own mathematical questions and following their own lines of enquiry

Activities for pupils working at greater depth:



During which year did both companies make the same percentage of profit?
 When was the percentage of profit the two companies made furthest apart?
 Which company has improved its performance the most? Why can you say this?
 Why should both companies feel confident about the percentage of profit they will make in 2006?



Create a number of questions to ask your friends about this line graph. Some must be associated with difference and additions. What do you think the temperature is likely to be at 4am? Give your reasons. Why do you think there was such a sharp dip in temperature between 3pm and 6pm?

Year 6 Maths Objectives

<i>Year 6 Objectives</i>			
	Number and Place Value	Expected	Greater Depth
N2	To read, write, order and compare numbers up to 10,000,000	Organise numbers in ascending or descending order up to 10,000,000	Organise numbers higher than 10,000,000 in ascending and descending order. Extend knowledge to ordering numbers according to their own chosen criteria and justify their answers.
N3	To determine the value of each digit	To be able to identify each place value column up to tens of millions	To be able to identify each digit and explaining why a statement is correct or wrong about a value, extending to decimal values. e.g. Miss Wong, the teacher, has four cards. On each card is a number: 59996 59943 60026 62312 She gives one card to each pupil. The pupils look at their card and say a clue. Anna says, 'My number is 60 000 to the nearest 10 thousand.' Bashir says, 'My number has exactly 600 hundreds in it.' Charis says, 'My number is 59900 to the nearest hundred.' David says, 'My number is 60 000 to the nearest 10.' Can you work out which card each pupil had? Explain your choices.
N4	To round any whole number to a required degree of accuracy	To be able to round any number up to 10,000,000 to the nearest 10, 100,1000, 10,000 ,100,000 and 1,000,000	To find all possible numbers that satisfy a criteria. To be able to explain why a rounded answer may meet a criteria or not. e.g. Eduardo says, 'The the population of Mexico City is 11 million (to the nearest million) and the population of New York is 11.2 million (to the nearest hundred thousand).' He says, 'The population of New York must be bigger than the population of Mexico City because 11.2 million is bigger than 11 million.' Do you agree with him?
N5	To use negative numbers in context and calculate intervals across 0	To be able to find the difference between positive and negative numbers various contexts e.g. temperature	To be able to find the difference between positive and negative numbers including decimal numbers applied in both word problems and graph questions. e.g.

			reading a temperature graph that fluctuates between positive and negative numbers and being able to track the differences.
N6	To solve number and practical problems that involve all of the above	To be able to answer a range of word and graph type questions independently	To be able to answer a wide range of word and graph type questions relating to place value and including negative numbers in context and explaining the reasoning e.g. A scientist measured the temperature each day for one week at 06:00. On Sunday the temperature was 1.6°C . On Monday the temperature had fallen by 3°C . On Tuesday the temperature had fallen by 2.1°C . On Wednesday the temperature had risen by 1.6°C . On Thursday the temperature had risen by 4.2°C . On Friday the temperature had fallen by 0.9°C . On Saturday the temperature had risen by 0.2°C . What was the temperature on Saturday?
C4	To solve addition and subtraction problems	To read and understand multiple step problems with confidence, knowing when to use addition and/or subtraction.	To read and understand multiple step problems with confidence, knowing when to use addition and/or subtraction and explain why each method is necessary in the context of the problem. e.g. Jasmine and Kamal have been asked to work out $5748 + 893$ and $5748 - 893$. Jasmine says, '893 is 7 less than 900, and 900 is 100 less than 1000, so I can work out the addition by adding on 1000 and then taking away 100 and then taking away 7.' What answer does Jasmine get, and is she correct? Explain your reasoning. e.g. Two numbers have a difference of 2.38. What could the numbers be if: the two numbers add up to 6? one of the numbers is three times as big as the other number?

			Two numbers have a difference of 2·3 . To the nearest 10, they are both 10. What could the numbers be?
C3	To use estimation to check answers	To estimate numbers when required in the context of a problem and to decide what the degree of accuracy should be e.g. more appropriate to round to the nearest 10 or 1000?	To estimate numbers and decimal numbers when required in the context of a problem and to decide what the degree of accuracy should be e.g. more appropriate to round to the nearest 10 or 1000? Apply estimation to check work independently and convince another why they are correct. e.g The total population of Shanghai is 21 million, to the nearest million. If at lunchtime everyone in Shanghai eats a bowl of rice, how many grains of rice do you estimate are eaten each lunchtime?
C5	To identify common factors, common multiples and prime numbers		
C7a	To multiply using the formal written method of multiplication	To multiply up to 4 digits by 2 digits with confidence.	To multiply up to 4 digits by 2 digits with confidence in a range of contextual problems such as finding possible numbers that satisfy a criteria. e.g Fill in the missing numbers to make these number sentences true. ____ × ____ = 864 ____ × ____ × ____ = 864
C7b	To divide numbers using the formal written method of long division	To divide numbers up to 4 digits by 2 digit numbers and being able to write the remainder as a whole number, fraction or decimals.	To solve more complex problems, justify or evaluate different answers by dividing numbers up to 4 digits by 2 digit numbers and being able to write the remainder as a whole number, fractions or decimals – rounding to a specified number of decimal places when required.
C7c	To divide numbers using the formal written method of short division	To divide numbers up to 4 digits by 2 digit numbers and being able to write the remainder as a whole number, fraction or decimals.	To solve more complex problems, justify or evaluate different answers by dividing numbers up to 4 digits by 2 digit numbers and being able to write the remainder as a whole number, fraction or decimals – rounding to a specified number or decimal place when required. To be able to find and justify the most efficient solution for solving a problem.
C9	To use BODMAS	To know what the order of operations are and to use them to complete more complicated	To know what the order of operations are and to use them to complete more complicated calculations including brackets. e.g. $7 + 5 \times (8 + 3) =$

		<p>calculations including brackets. e.g. $7 + 5 \times (8 + 3) =$ Is the answer 99, 132 or 62</p>	<p>Is the answer 99, 132 or 62 Why? To be able to explain their reasoning with confidence and to use the most efficient way of finding the solution. e.g. Which calculation is the odd one out? 753×1.8 $(75.3 \times 3) \times 6$ $753 + 753 \div 5 \times 4$ 7.53×1800 $753 \times 2 - 753 \times 0.2$ $750 \times 1.8 + 3 \times 1.8$ Explain your reasoning</p>
C8	To solve problems using all 4 operations	<p>To follow multiple step problems involving addition, subtraction, multiplication and division with success.</p>	<p>To be able to justify an answer based on correct order of calculations when using different operations. To be able to question another person's approach to solving a problem and evaluate its relative success. e.g. There are 100 sheets in the box. There are 10 labels on each sheet. Calculate the cost of one label, in pence. A box of labels costs £63. There are 140 sheets in the box. There are 15 labels on each sheet. Sara, Ramesh and Trevor want to calculate the cost of one label, in pence. Ramesh uses the number sentence $(6300 \div 140) \times 15$. Sara uses the number sentence $63 \div 1.4 \div 15$. Trevor uses the number sentence $(15 \times 140) \div 6300$. Who is using the right number sentence? Explain your choice.</p>
F3	To compare and order fractions	<p>To be able to compare and order fractions by converting them into a common denominator. e.g. $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2} =$ All converted into eighths $\frac{2}{8}$, $\frac{3}{8}$, $\frac{4}{8}$</p>	<p>To be able to compare and order fractions by converting them into a common denominator and justifying their ideas in problem scenarios. e.g. which is the odd one out and why? 0.4, $\frac{2}{5}$, $\frac{4}{10}$, $\frac{8}{20}$, $\frac{6}{15}$, $\frac{3}{6}$</p>

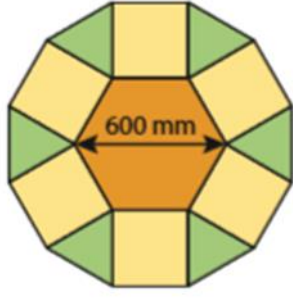
F4	To add and subtract fractions with different denominators and mixed numbers	To be able to convert both denominators using a common multiple.	To be able to convert both denominators using the lowest common multiple for the most efficient method. To be able to explain why finding the LCM is more effective. (No need to simplify) e.g. On Wednesday I ran some km and my sister ran $1 \frac{1}{6}$ km further than I did. Altogether we ran $4 \frac{1}{2}$ km. How far did I run on Wednesday? e.g. The sum of two fractions is always greater than their product. If I divide a fraction by a whole number, the quotient is always smaller than the dividend. Explain your reasoning.
F5a	To multiply simple pairs of proper fractions	To be able to multiply any pair of fractions confidently using the basic method.	To be able to multiply pairs of fractions and a fraction by a whole number by knowing you can place the number above a denominator of 1. Being able to do this as part of problem solving. E.g. to find $\frac{1}{8}$ of 20 you can write $\frac{1}{8} \times \frac{20}{1} = \frac{20}{8} = 2 \frac{4}{8} = 2.5$
F5b	To divide proper fractions by whole numbers	To divide proper fractions by whole numbers e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$	To be able to apply this method to divide fractions of amounts in more complex problems. $\frac{1}{6} \div 24 = \frac{1}{6} \times \frac{1}{24}$ e.g. Puja shares 6 apples between some friends. Each friend gets 0.75 of an apple. How many friends does she share the apples with?
F6	To associate a fraction with division and calculate decimal fraction equivalents	To be able to find the decimal equivalent of common fractions e.g. $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{4}{5}$ To be able to use short division to find the decimal equivalent e.g. 1 divided by 4.	To be able to convert fractions into decimals and vice versa as a more efficient way of finding equivalent values to be able to justify an answer. Be able to explain why a fraction and decimal can have an equivalent value by converting decimals to hundredths and simplifying. Which is the odd one out? $\frac{2}{5}$, 0.4, $\frac{4}{10}$, $\frac{3}{6}$, $\frac{6}{15}$

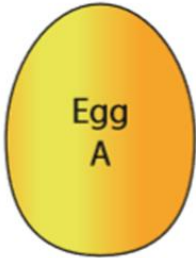
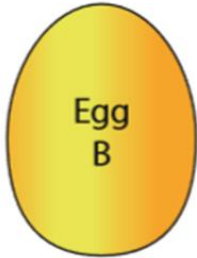
			<p>Explain your choice.</p> <p>Put the following numbers into groups: $\frac{3}{4}$, $\frac{3}{2}$, 0.5, 1.25, $\frac{3}{8}$, 0.125.</p> <p>Explain your choices.</p>
F9a	To identify the value of each digit up to 3 decimal places and multiply and divide by 10, 100, 1000.		
F9b	To multiply 1 digit numbers with up to 2 decimal places with whole numbers.		<p>To be able to multiply and divide larger decimal numbers within the context of problem explaining their reasoning.</p> <p>E.g. A ferry can travel a distance of 16.86 miles in 1 hour. How far can the ferry travel in 5 hours? 15 hours? How far can the ferry travel in 20 minutes? Sharon says the answer is 5.25 miles. Is she correct? Explain your reasoning.</p>
F11	To recall and use equivalencies between simple fractions, decimals and percentages	To be able to recognise the relationship between fractions, decimals and percentages and express them as equivalent quantities (e.g. one piece of cake that has been cut into 5 equal slices can be expressed as $\frac{1}{5}$ or 0.2 or 20% of the whole cake).	<p>To be able to reason/justify why an amount is greater or lesser than another using these equivalencies and applying to multiple contexts when problem solving</p> <p>E.g. On a long car journey, Mr.Barlow has driven 27% of the distance and Mrs. Barlow has driven $\frac{6}{20}$ of the distance. Who has driven the greater distance? Explain your reasoning. How much of the journey is left? Give your answer as a percentage.</p>
R1	To solve problems involving the relative sizes of 2 quantities where missing values can be found using integer multiplication and division facts.	To be able to find unknown amounts by scaling up or down using multiplication or division facts such as recipe style questions. E.g. if 4 servings = 50g flour, how much flour do I need for 10 servings.	<p>To be able to find possible numbers that satisfy the criteria and justify how you can find unknown amounts by scaling up or down using multiplication or division facts and apply to more complex problem scenarios.</p> <p>e.g. Jake has made a giant pizza. He says, 'I made three times as much sauce to cover the giant pizza as I do to cover a normal pizza, so the giant pizza is three times as big as the normal pizza.'</p>


			Do you agree with Jake?
R2	To solve problems involving the calculation of percentages	To be able to find the percentage of an amount in a single or multi step problem. e.g. I send out 48 invitations and 25% of replies came back. How many replies am I still waiting for?	To be able to solve problems by converting between fractions and percentages and prove their answers by explaining their reasoning. e.g. In a class 30% are girls 21 children in the class are boys – how many children are in the class? Explain your answer.
R3	To solve problems involving similar shapes where the scale factor is known		
R4	To solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	To be able to divide an amount in a given ratio such as 3:2 knowing that there would be 5 equal parts. e.g. 150 divided 3:2 = 90:60	To be able to interpret more complex problems requiring the number of equal parts to be identified and then the relative quantities. E.g. Dave had to feed giraffes, zebras and antelopes. There are twice as many zebras as giraffes and four times as many zebras as antelopes. There are four antelopes. Each animal gets the same amount of food. Dave has 60kg of food in total – how much food is needed for each enclosure? E.g. Harry and Jim share some marbles in the ratio 3:5. Jim gets 24 more marbles than Harry does. How many marbles did they share in total between them?
A3	To generate and describe number sequences	To explain whether they agree or disagree with sequences of numbers fitting a particular rule. e.g. start at 4 and keep adding 5- if I write out multiples of 5 and subtract 1 from each number – will I always be right? Explain.	To be able to identify the algebraic rule to find the nth term. To explain their reasoning about interpretations of rules. To reverse the operation to find the term number for a question. To be able to explain what is the same or different about numbers in a sequence. E.g Ramesh is exploring three sequence-generating rules. Rule A is: ‘Start at 30, and then add on 7, and another 7, and another 7, and so on.’

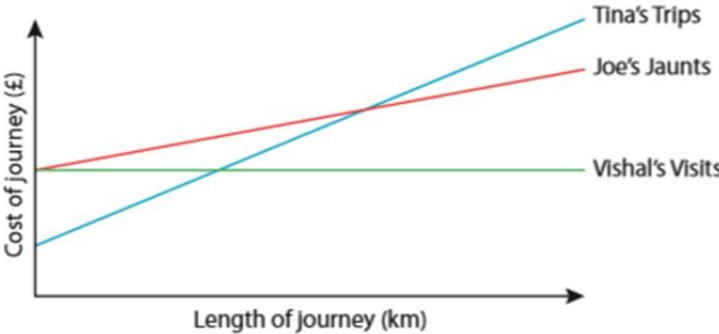
			<p>Rule B is: 'Write out the numbers that are in the seven times table, and then add 2 to each number.'</p> <p>Rule C is: 'Start at 51, and then add on 4, and another 4, and another 4, and so on.'</p> <p>What's the same and what's different about the sequences generated by these three rules?</p> <p>Explain why any common patterns occur.</p>
A1	To express missing number problems algebraically	To be able to substitute a shape or letter to represent an unknown value e.g. $p = 2l + 2w$	<p>To be able to substitute a shape or letter to represent an unknown value e.g. $p = 2l + 2w$. To find the possible numbers that satisfy the algebraic criteria.</p> <p>E.g.</p> <p>Which of the following statements do you agree with? Explain your decisions.</p> <p>There is a whole number that satisfies the symbol sentence $5 \times - 3 = 42$</p> <p>There is a whole number that satisfies the symbol sentence $5 + \times 3 = 42$</p> <p>There is a whole number that solves the equation $10 - x = 4x$</p> <p>There is a whole number that solves the equation $20 \div x = x$</p>
A4	To find pairs of numbers that satisfy an equation with 2 unknowns	<p>To be able to systematically test values to satisfy a number statement to answer word problems. A value will solve a symbol sentence (or equation) if by substituting that value it satisfies the statement (makes it true)</p> <p>e.g. I am going to buy some 10p stamps and some 11p stamps. I want to spend 93p. Write this as a symbol sentence.</p> <p>How many of each stamp could I buy?</p>	<p>To be able to systematically test values to satisfy a number statement to answer word problems. A value will solve a symbol sentence (or equation) if by substituting that value it satisfies the statement (makes it true) and justify/explain their reasoning.</p> <p>e.g. I am going to buy some 10p stamps and some 11p stamps. I want to spend exactly £1.59. Can you convince yourself that you can't find whole number values to satisfy your symbol sentence?</p>

G2	To compare and classify 2D shapes based on their properties	To know what is meant by parallel, perpendicular sides, regular irregular shape, acute, obtuse and reflex angles, reflective symmetry and apply their knowledge to sort various shapes into Carroll/Venn diagrams	To know what is meant by parallel, perpendicular sides, regular irregular shape, acute, obtuse and reflex angles, reflective symmetry and apply their knowledge to sort various shapes into Carroll/Venn diagrams and to justify their reasoning
G3a	To draw 2D shapes using given dimensions and angles	To complete simple shapes using given lengths, such as 7.5cm (accurate to +/- 2mm) and accurate angles (accurate to +/- 2°)	To complete more complex shapes including compound shapes using given lengths, such as 7.5cm (accurate to +/- 2mm) and accurate angles (accurate to +/- 2°) To be able to use knowledge of shape properties to complete more advanced tasks such as scale shapes while drawing. e.g. Draw an equilateral triangle 3 times the size of one that has sides of 7.5cm. Children should know that the angle will not change when the length of each side does)
G3b	To recognise, describe and build simple 3D shapes including making nets	To recognise the most common 3D shapes using both 3D and 2D representations. To describe the key features of 3D shapes. To create 2D nets.	To recognise, describe 3D shapes and nets and to sort shapes according to their properties justifying their answers. To use shape reasoning to answer problems referring to 3D shapes and their nets including be able to identify properties even at different angles and being able to see and draw different 3D and 2D shapes between isometric and grid paper. E.g. Pascal says that any net made with six squares can be folded to make a cube. Do you agree with him? Explain your reasoning.
G5	To illustrate and name parts of circles	To be able to name the radius, diameter and circumference and know that the diameter is twice the size of the radius.	To be able to name the radius, diameter and circumference and know that the diameter is twice the size of the radius. To apply this knowledge to problems and justify your reasoning.

G4a	<p>To find unknown angles in any triangles, quadrilaterals and regular polygons</p>	<p>To use mathematical reasoning to find missing angles (e.g. the missing angle in an isosceles triangle when one of the angles is given; the missing angle in a more complex diagram using knowledge about angles at a point and vertically opposite angles).</p>	<p>To use and apply shape properties to find unknown values. To use algebra, bar models or trial and experiment to find unknown values.</p> <p>E.g. A triangle has been drawn carefully. You are told that the biggest angle is 20° larger than the second biggest angle and 40° larger than the smallest angle. Work out how big each angle is.</p>  <p>Here is a tiled floor pattern. It is made from equilateral triangles, squares and a regular hexagon. Work out the perimeter of the design. Give your answer in metres.</p>
G4b	<p>To recognise angles where they meet at a point, are on a straight line, vertically opposite and find missing angles</p>	<p>The pupil can use mathematical reasoning to find missing angles on a point knowing that 180° is the angle for a straight line and a full turn is 360°</p>	
P1	<p>To describe positions on the full coordinate grid (all four quadrants)</p>		<p>E.g. An isosceles triangle has two vertices at $(-3,2)$ and $(3,2)$. Explore where the third vertex could be.</p>
P2	<p>To draw and translate simple shapes on the coordinate plane, and reflect them in the axes</p>		<p>E.g. Joan says that if you reflect a shape (in an axis) and then reflect it again, the shape always ends up back where it first was as though you'd done nothing to it. Do you agree with Joan? Explain your decision.</p>

<p>M5</p>	<p>To use, read, write and convert between standard units of length, mass, volume and time using decimal notation</p>	<p>To read a scale successfully, identifying the unit and working out how much each mark or division on the scale represents. e.g. working out a problem in grams by reading a scale and converting the answer to kg Answering time problems in both analogue and digital.</p>	<p>To read a scale successfully, identifying the unit and working out how much each mark or division on the scale represents- justifying confident conversions when answering problems e.g. imagine we talked about time using decimals. What would 2.3 hours represent? Explain your answer.</p>
<p>M6</p>	<p>To solve problems involving the calculation and conversion of units of measure, using decimal notation.</p>	<p>To understand what units are being used in a problem which may involve reading a scale, clock or table successfully. To read a scale successfully, identifying the unit and working out how much each mark or division on the scale represents. e.g. working out a problem in grams by reading a scale and converting the answer to kg Answering time problems in both analogue and digital.</p>	<p>To understand what units are being used in a problem which may involve reading a scale, clock or table successfully. To read a scale successfully, identifying the unit and working out how much each mark or division on the scale represents- justifying confident conversions when answering problems e.g. imagine we talked about time using decimals. What would 2.3 hours represent? Explain your answer.</p> <p>In a story, Jack has to choose between two magic gold eggs to buy. What would you advise him to do?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Egg A</p> <p>Mass when he buys it: 1.2 g Mass doubles each day</p> </div> <div style="text-align: center;">  <p>Egg B</p> <p>Mass when he buys it: 125 g Mass increases by 0.01 kg each day</p> </div> </div>
<p>M7</p>	<p>To recognise that shapes with the same areas can have different perimeters and vice versa</p>	<p>To experiment with different shapes to demonstrate how different shapes can have the</p>	<p>To be able to explain why a shape with a greater perimeter than another may have a smaller area and vice versa.</p>

		same are but different perimeters and vice versa.	
M7b	To calculate the area of parallelograms and triangles.	To be able to use the formulae for areas of triangles and parallelograms to solve problems.	To be able to use the formulae for areas of triangles and parallelograms to solve problems involving composite shapes. To be able to identify how composite shapes can be made up from parallelograms and triangles as well as squares and oblongs.
S1	To interpret and construct pie charts and line graphs and use these to solve problems		<p>To be able to read and interpret pie charts in terms of proportions of segments and relate to fractions and percentages to solve problems and justify answers knowing that $100\% = 360^\circ$ of the whole circle (pie)</p>  <p>E.g. The pie chart represents the proportions of the four ingredients in a smoothie drink. The sector representing the amount of strawberries takes up 22% of the pie chart. The sector representing the amount of apple is twice as big as the sector representing the amount of strawberries. The sectors representing the amount of yoghurt and the amount of banana are identical. Estimate the angle of the sector representing the amount of banana. Explain your reasoning.</p>

			<p>Three taxi companies each work out the cost of a journey in different ways. I have taken lots of journeys with each of the companies, and have recorded each time how long the journey was (in km) and the cost of the journey (in £). I have represented these data on this graph.</p>  <p>What's the same and what's different about the ways in which the three companies work out the cost of a journey? Which might you choose if you wanted to book a taxi to make a journey? Explain your reasoning.</p>
S3	<p>To calculate and interpret the mean</p>	<p>To be able to find the mean of any set of numbers by adding them together and dividing by the number of values.</p> <p>e.g. $54 + 87 + 67 + 45 = ?$</p>	<p>To be able to reverse operations to find missing numeric values when given the mean.</p> <p>e.g. The average run time for 4 people was 10 seconds Mike took 12 seconds Faris took 8 seconds Leon took 11 seconds. How long did the 4th person take?</p> <p>E.g. Three teams are taking part in the heats of a 4×100 m relay race competition on Sports Day. If the mean average time of the four runners in a team is less than 30 seconds, the team will be selected for the finals. At the start of the last leg of the relay race, the times (in seconds) of each teams' first three runners are:</p>

			<p>Team Peacock: 27, 29, 31 Team Farah: 45, 43, 37 Team Ennis: 29, 30, 25 Which of the teams have the best chance of being selected? Explain your reasoning.</p>
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